

AN INFORMATION DOCUMENT ON THE CURRENT STATE OF RESEARCH ON ILLICIT DRUGS IN AUSTRALIA

Commissioned by the NHMRC
as background information for the SRDC's Illicit Drug Research Program.

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In mid 1998 the Strategic Research Development Committee, a Principal Committee of the National Health and Medical Research Council commissioned the National Drug and Alcohol Research Centre (NDARC) to prepare this summary of research undertaken in the past ten years into illicit drug use in Australia. This information was used at a workshop in Sydney in November 1998 where key stakeholders were brought together by the SRDC to assist in the design of a research agenda around illicit drug use.

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CONTENTS

| | |
|---|------------|
| ACKNOWLEDGMENTS | v |
| PREFACE..... | vi |
| ABBREVIATIONS | vii |
| EXECUTIVE SUMMARY..... | ix |
| OVERVIEW | xxi |
| 1.0 INTRODUCTION..... | 1 |
| 2.0 METHODOLOGY..... | 1 |
| 3.0 EPIDEMIOLOGY OF ILLICIT DRUG USE IN AUSTRALIA..... | 3 |
| 3.1 PREVALENCE AND PATTERNS OF ILLICIT DRUG USE AMONG THE GENERAL POPULATION. | 3 |
| 3.2 PREVALENCE AND PATTERNS OF ILLICIT DRUG USE AMONG SPECIAL POPULATIONS | 4 |
| 3.2.1 <i>Youth</i> | 4 |
| 3.2.2 <i>Injecting drug users</i> | 5 |
| 3.2.3 <i>Users of specific illicit substances</i> | 7 |
| 3.2.3.1 Cannabis..... | 7 |
| 3.2.3.2 Heroin..... | 8 |
| 3.2.3.3 Amphetamines..... | 8 |
| 3.2.3.4 Cocaine | 9 |
| 3.2.3.5 Other illicit drugs | 10 |
| 3.2.4 <i>Women</i> | 11 |
| 3.2.5 <i>Indigenous Australians</i> | 12 |
| 3.2.6 <i>Persons from culturally and linguistically diverse backgrounds</i> | 13 |
| 3.2.7 <i>Prisoners</i> | 14 |
| 3.2.8 <i>Homeless persons</i> | 15 |
| 3.2.9 <i>Gay communities</i> | 16 |
| 3.2.10 <i>Clinical populations</i> | 18 |
| 3.3 MONITORING SYSTEMS | 19 |
| 4.0 ANTECEDENTS AND RISK FACTORS FOR ILLICIT DRUG USE..... | 20 |
| 4.1 BIOLOGICAL FACTORS..... | 21 |
| 4.2 PSYCHOSOCIAL FACTORS | 22 |
| 4.3 CONTEXTUAL FACTORS..... | 23 |

| | |
|---|-----------|
| 5.0 DRUG-RELATED HARMS..... | 25 |
| 5.1 MORTALITY AND MORBIDITY..... | 25 |
| 5.2 ADVERSE HEALTH AND PSYCHOLOGICAL EFFECTS | 26 |
| 5.2.1 <i>Drug-specific harms</i> | 26 |
| 5.2.1.1 Cannabis..... | 26 |
| 5.2.1.2 Opioids..... | 28 |
| 5.2.1.3 Amphetamines..... | 31 |
| 5.2.1.4 Cocaine..... | 32 |
| 5.2.1.5 Other illicit drugs | 33 |
| 5.2.2 <i>Non-drug specific harms</i> | 34 |
| 5.2.2.1 Blood-borne viruses | 34 |
| 5.2.2.2 Other injection-related harms | 36 |
| 6.0 INTERVENTIONS TO REDUCE DRUG-RELATED HARMS..... | 37 |
| 6.1 PRIMARY PREVENTION | 37 |
| 6.1.1 <i>Mass media</i> | 37 |
| 6.1.2 <i>School education</i> | 39 |
| 6.1.3 <i>Cannabis legislation</i> | 39 |
| 6.1.4 <i>Codes of practice for dance venues</i> | 40 |
| 6.2 SECONDARY PREVENTION | 41 |
| 6.2.1 <i>Information dissemination</i> | 41 |
| 6.2.2 <i>Self-help strategies</i> | 42 |
| 6.2.3 <i>Needle exchanges</i> | 43 |
| 6.2.4 <i>Injecting rooms</i> | 44 |
| 6.3 TERTIARY PREVENTION | 44 |
| 6.3.1 <i>Detoxification</i> | 45 |
| 6.3.2 <i>Pharmacological treatments</i> | 47 |
| 6.3.2.1 Methadone..... | 47 |
| 6.3.2.2 Other pharmacotherapies for opioid dependence..... | 48 |
| 6.3.2.3 Amphetamine substitution..... | 50 |
| 6.3.2.4 Cocaine substitution..... | 51 |
| 6.3.2.5 Pharmacotherapies for benzodiazepine dependence..... | 52 |
| 6.3.3 <i>Psychological treatments</i> | 52 |
| 6.3.3.1 Large-scale comparative studies in the U.S. & U.K. | 52 |
| 6.3.3.2 Cognitive behavioural..... | 54 |
| 6.3.3.3 Behavioural..... | 55 |
| 6.3.3.4 Psychotherapy..... | 55 |
| 6.3.3.5 Therapeutic communities | 56 |
| 6.3.3.6 Self help..... | 56 |
| 6.3.3.7 Other..... | 57 |
| 6.3.4 <i>Alternative treatments</i> | 58 |
| 6.3.4.1 Herbal medicine | 58 |
| 6.3.4.2 Acupuncture | 58 |
| 6.3.5 <i>Special populations</i> | 59 |
| 6.3.5.1 Youth..... | 59 |
| 6.3.5.2 IDU..... | 60 |
| 6.3.5.3 Women..... | 60 |
| 6.3.5.4 Indigenous Australians | 61 |

| | |
|--|-----------|
| 6.3.5.5 C&LD populations | 62 |
| 6.3.5.6 Prisoners..... | 62 |
| 6.3.5.7 Dually diagnosed..... | 63 |
| 6.4 ECONOMIC APPRAISAL OF ILLICIT DRUG PROBLEMS..... | 64 |
| 7.0 OVERVIEW OF CURRENT ILLICIT DRUG RESEARCH | 65 |
| 8.0 BIBLIOGRAPHY..... | 67 |
| INTRODUCTION..... | 67 |
| METHOD..... | 67 |
| EPIDEMIOLOGY OF ILLICIT DRUG USE IN AUSTRALIA | 67 |
| ANTECEDENTS AND RISK FACTORS FOR ILLICIT DRUG USE..... | 76 |
| DRUG-RELATED HARMS | 78 |
| INTERVENTIONS TO REDUCE DRUG-RELATED HARMS..... | 83 |
| 9.0 APPENDICES | 96 |
| APPENDIX A: STAKEHOLDER DETAILS | 96 |
| APPENDIX B: FUNDING DETAILS..... | 98 |
| TABLE 1: FUNDING DETAILS FOR CURRENT PROJECTS ON PATTERNS OF ILLICIT DRUG USE AND ASSOCIATED HARMS..... | 99 |
| TABLE 2: FUNDING DETAILS FOR CURRENT PROJECTS ON ANTECEDANTS | 105 |
| TABLE 3: FUNDING DETAILS FOR CURRENT PROJECTS ON INTERVENTIONS..... | 107 |

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PREFACE

This document provides a summary of research on illicit drug use that has been undertaken in Australia over the past decade. Because it was compiled in six weeks we would not claim that it includes all research on this topic. The report comes in two parts. The first part is a highly condensed 6,000 word executive summary and brief commentary on the remainder of the report. This is the type of document that was originally requested by the NH&MRC. It became apparent in the process of compiling Australian research on illicit drugs that a longer document was required to do justice to the topic. The second part of the report accordingly provides a more detailed (but still brief) summary of Australian illicit drug research. It includes review papers and some references on individual research projects, it notes research projects that are in progress, and it includes a list of emerging issues identified by key informants and the literature. Part one provides a broad-brush overview of illicit drug research in Australia. The more detailed sections of the second part of the report should be read by those with an interest in particular areas of research.

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ABBREVIATIONS

| | |
|-------------------|--|
| AAS | Anabolic-androgenic steroids |
| ADCA | Alcohol and Drugs Council of Australia |
| AIHW | Australian Institute of Health and Welfare |
| ANU | Australian National University |
| ANAIDUS | Australian National AIDS and Injecting Drug Use Study |
| ASHIDU | Australian Study of HIV and Injecting Drug Use |
| ANCARD | Australian National Council on AIDS and Related Diseases |
| ASPD | Anti-social personality disorder |
| CALDATA | California Drug and Alcohol Treatment Assessment |
| CBT | Cognitive behavioural treatment |
| CDHFS | Commonwealth Department of Health and Family Services (now Commonwealth Department of Health and Aged Care; CDHAC) |
| CEIDA | Centre of Education and Information on Drugs and Alcohol |
| CEN | Cannabis Expiation Notice |
| C&LD | Culturally and Linguistically Diverse populations |
| CNS | Central nervous system |
| DAMEC | Drug and Alcohol Multicultural Education Centre |
| DASC | Drug and Alcohol Services Council (Adelaide) |
| DATOS | Drug Abuse Treatment Outcome Study (U.S.) |
| DAWN | Drug Abuse Warning Network |
| DUFP | Drug Use Forecasting Program |
| DUMA | Drug Use Monitoring in Australia |
| HBV | Hepatitis B virus |
| HCV | Hepatitis C virus |
| IDRS | Illicit Drug Reporting System |
| IDU | Injecting drug use |
| IOM | Institute of Medicine |
| LAAM | Levo-alpha-acetylmethadol |
| MDMA | Ecstasy; 3,4-methylenedioxymethamphetamine |
| MMT | Methadone maintenance treatment |
| NCADA | National Campaign Against Drug Abuse |
| NCEPH | National Centre for Epidemiology and Population Health |
| NCETA | National Centre for Education and Training in the Addictions |
| NCHECR | National Centre for HIV Epidemiology and Clinical Research |
| NCRPDA | National Centre for Research on the Prevention of Drug Abuse |
| NDARC | National Drug and Alcohol Research Centre |
| NDS | National Drug Strategy; formerly National Campaign Against Drug Abuse |
| NEPOD | National Evaluation of Pharmacotherapies for Opioid Dependence |
| NIDS | National Illicit Drugs Strategy |
| NH&MRC | National Health and Medical Research Council |
| NSEP | Needle and syringe exchange program |
| NSMHWB | National Survey of Mental Health and Well-Being |
| NTORS | National Treatment Outcome Research Study (U.K.) |
| NUAA | NSW Users and AIDS Association |
| QAP | Quality Assurance Project |
| RCT | Randomised controlled trial |

| | |
|-------------|---|
| RODA | Rapid opiate detoxification under anaesthetic |
| SES | Socio-economic status |
| SRDC | Strategic Research Development Committee |
| TAFE | Technical and Further Education |
| TC | Therapeutic community |

EXECUTIVE SUMMARY

The Strategic Research Development Committee (SRDC) of the National Health and Medical Research Council (NH&MRC) has been allocated approximately \$4,000,000 over four years by the National Illicit Drugs Strategy (NIDS) for research on illicit drugs. SRDC commissioned this scoping document to summarise current research on the topic which would inform a workshop that intends to identify funding priorities. This document:

1. provides an overview of research into illicit drugs undertaken over the past 10 years;
2. summarises major reviews of research on illicit drugs from Australia and elsewhere;
3. lists existing research projects funded through the major national or State funding bodies, drug research centres and other Commonwealth and State government initiatives;
4. identifies emerging areas of interest in Australian illicit drugs research.

METHODOLOGY

Research was classified into the following four key research domains:

1. the prevalence and patterns of illicit drug use in the general and special populations;
2. biological, psychosocial and contextual risk factors for illicit drug use;
3. drug-related harms, i.e. premature mortality and morbidity;
4. the evaluation of interventions to reduce drug-related harms, including primary, secondary and tertiary health interventions.

Information is provided according to the main types of illicit drugs, namely, cannabis, heroin, amphetamines and cocaine, and other illicit drugs where relevant. Special consideration is given to Indigenous Australians, prisoners, women, injecting drug users, persons from Culturally and Linguistically Diverse populations and youth. Research type and quality is described and emerging areas of interest and potential research priorities are identified.

A brief questionnaire was completed by 29 researchers who had published or obtained funds to conduct research on illicit drug use in Australia during the previous two years. These stakeholders were asked: to provide two major Australian and overseas reviews in their area of expertise, and up to five key articles not included in these review papers; to identify emerging areas of interest and research priorities; to comment on the draft scoping document; and to nominate two other Australian experts in their area to ensure that researchers were adequately sampled.

Funding details of existing research projects on illicit drugs were sought from the major Commonwealth and State funding bodies and specialist drug research centres. These organisations were asked to provide details on: the project name, host institution, funding source, funds awarded, the years the project was funded, and collaborators (optional). This information was obtained from annual reports and other records.

EPIDEMIOLOGY OF ILLICIT DRUG USE IN AUSTRALIA

General population: The NDS Household surveys provide reasonable data on the use in general population of the more commonly used illicit drugs (such as cannabis) between 1988 and 1995. These survey data are of limited use in describing trends in the use of illicit drugs with low base rates, such as, heroin and cocaine. However, the sample size for the 1998 national household survey has been increased to 10,000, with a substantial over-sampling of the 14-39 year age group. A range of methods of collecting data on illicit drug users is required to provide more detailed information about patterns and trends in use.

Youth: Surveys of school and TAFE populations provide useful indicators of illicit drug use among school and non-school youth populations, and complement data from NDS surveys and specialist studies. In the past these have been intermittent and uneven in their coverage of different States. The first national school survey of drug use among secondary school students was conducted in 1996 by the Victorian Anti-Cancer Council; there are plans to repeat this survey in 1999. The results of the 1996 TAFE survey have only just been released. The timely release of data, independent of the political process, is highly desirable. The regular collection of national school survey data on illicit drug use is desirable to monitor trends in illicit drug use among adolescents. Another source of useful information could be provided by studies using targeted samples and qualitative methods to examine youth drug using subcultures.

Injecting drug users: HIV/AIDS specific funding has enabled large national surveys of injecting drug users to be conducted (e.g. ANAIDUS and ASHIDU). Regular surveys of NSEP attenders are used to monitor HCV and HIV seroprevalence. There is consistency in the findings of these studies, suggesting that the data quality is reasonable. There are good data on the characteristics of injecting drug users and their risk taking behaviours. Future work could be carried out to provide better estimates of the size of the IDU population. A better understanding of IDU groups not accessing treatment or reached by peer-related research would also be of use. Furthermore, future research should examine factors that increase the likelihood of initiating injecting drug use, given the risks associated with this route of administration. Long-term cohort studies of injecting drug users are needed.

Users of specific illicit substances

Cannabis: Data on the frequency of cannabis use are collected in household and school surveys, but there have been very few studies of regular cannabis users in the community. There has been an increase in lifetime and annual cannabis use in Australia over the past decade, and the prevalence of cannabis use is high among adolescents and young adults. Future work could examine issues surrounding this prevalence, including longitudinal studies of cannabis use among adolescents. Another emerging concern has been a reported increase in average cannabis potency, an issue on which no data are regularly collected or reported.

Heroin: There have been regular surveys of convenience samples of heroin injectors as part of HIV surveillance, in studies of non-fatal overdose, benzodiazepine use and methadone use, and as part of the IDRS, with some ethnographic and quantitative research on heroin use in Sydney and Melbourne. Such research has identified changes in the demographic characteristics of new heroin users and in their initial routes of administration (increased

numbers are smoking rather than injecting), and an expansion in the scale of the heroin market in Australia. Future research could examine the effect of changing characteristics of the heroin market on patterns (and the resulting harms) of heroin and other drug use.

Amphetamines: Household and school surveys provide limited information on patterns of amphetamine use among adolescents and young adults. More detailed data have come from several special purpose surveys of non-treatment samples of amphetamine users, many of whom experience adverse effects of their use, and substantial proportions inject the drug. These studies have examined users' reasons for making the transition from oral and intranasal use to injecting. Future research could examine ways to reduce the likelihood of transitions to injecting use.

Cocaine: The limited research on cocaine use in Australia has shown low prevalence of use, and very low rates of problematic use. However, recent evidence from inner city Sydney medical services, a WHO study and the Illicit Drug Reporting System suggests that the prevalence of cocaine use has increased among injecting drug users, with other recent research suggesting a spread in the use and injection of cocaine to other areas of Sydney. These trends require further investigation given the seriousness of the problems that cocaine use can cause, and the increased risks of HIV and HCV transmission among those who inject the drug.

Other illicit drugs: A recent survey of ecstasy users in three States suggests that users are younger, and are engaging in heavier patterns of ecstasy and other drug use than users in earlier studies, with some users injecting the drug. There is limited evidence on patterns of steroid use that suggests that some users are engaging in heavy and sustained use of these and other performance enhancing substances. Emerging issues include apparent changes in the features of ecstasy use, particularly injection of ecstasy; and a lack of research on the use of steroids among adolescents, women, gay and rural populations.

Other Special Populations

Women: There has been limited Australian and overseas research on women with drug and alcohol problems, much which has been done in treatment populations. In Australia, data from the 1985-95 National Household Surveys show that males are more likely than females to report lifetime use of all illicit drugs and to have injected. A national study of the characteristics of women with drug problems found women to be both under-represented and poorly served by services that have primarily catered for men.

Indigenous Australians: There are limited data on illicit drug use in the Indigenous Australian population; most population surveys include too few Indigenous Australian respondents to reliably estimate their drug use. The best data comes from the Indigenous Australian supplement to the National Drug Strategy Household Survey. There have also been several surveys in specific Indigenous Australian communities. A needs assessment of Indigenous Australian injecting drug use is being conducted by NCETA, and by the Victorian Aboriginal Health Service. Research suggests an increased prevalence of injecting drug use among urban and rural Indigenous Australian populations. Issues of concern include the spread of volatile solvent use to northern Queensland and rural NSW, legislative changes in

some states making kava an illicit drug in Indigenous Australian communities, injecting drug use and polydrug use.

Persons from Culturally and Linguistically Diverse populations: A limited amount of quantitative and qualitative research into illicit drug use among specific Culturally and Linguistically Diverse (C&LD) populations has been conducted in New South Wales. More recently, ethnographic research has explored illicit drug use and drug-related harms in a C&LD population in south west Sydney and Melbourne. An important emerging issue concerns the effects of changes in the availability of drugs on patterns of use, and associated harms in C & LD injecting drug users. Other issues of concern are the association between migration, refugee status and return visits to countries of origin and their impact on substance use and associated harms, and the influence of acculturation on illicit drug use among adolescent children of C&LD parents. There is a need for a better understanding of the social networks, economics and geography of illicit drug use among C&LD communities.

Prisoners: The Australian prison population increased by 50 percent over the last decade to 19,000 inmates in 1998, and the annual throughput is almost double this figure. A survey of a random sample of 800 inmates in NSW in 1996 found that one third of female inmates and one fifth of male inmates reported injecting while in prison, two thirds of whom reported sharing syringes (69%). There has been limited research on injecting drug use and infectious disease prevalence in prison populations. Prison research ethics committees have delayed research, prevented specific studies from being conducted and stipulated what type of research can be conducted and reported. Given evidence on the role of imprisonment in the transmission of HCV, this is a topic deserving of more research. Since some C&LD groups and the Indigenous population are over-represented in prisons, they may be disproportionately affected by the harms associated with drug use in prisons.

Homeless persons: It has been difficult to obtain representative samples of homeless persons so most studies of adults and adolescents have been convenience samples of street and homeless shelter residents. Most studies employ quantitative survey designs, with limited qualitative or ethnographic comparative work. The limited data indicate high rates of illicit drug use, drug use disorders and drug-related harm in this population. Better data are needed on this high-risk population. An important issue concerns a lack of information on interactions between illicit drugs and medications administered for mental illness (which many homeless persons are prescribed).

Gay communities: Data on illicit drug use in gay community and non-attached gay community samples are limited because of problems recruiting from these populations. Cohort studies from the National Centre for HIV Social Research collect data on substance use and HIV risk behaviour data among gay men. A large scale ethnographic study of gay men's drug use (to be released early next year) includes information on drug use and related harms among those who attend gay clubs. Emerging issues include: the prevalence and patterns of drug use among lesbians; recreational drug use by HIV positive gay men and its influence on anti-HIV therapies; co-infection and drug use; the association between substance use and suicide in young gay populations; and the role of injecting drug use in establishing a gay identity among gay youth.

Clinical populations: Three national censuses of clients of treatment agencies have been conducted to monitor trends in client characteristics, drug use patterns, and treatment seeking. They have not included data from clients attending methadone programs, self-help groups, sobering-up centres, or services that provide information, education, accommodation, brief counselling, telephone counselling and crisis interventions. A national minimum data set is being developed for drug and alcohol treatment services that will allow trends in client populations to be monitored more closely. Further research is required to study changes in the characteristics of treatment seekers from high-risk populations (e.g. Indigenous Australians, youth, injecting drug users).

Monitoring systems

The Illicit Drug Reporting System was established in 1996 to monitor trends in illicit drug use. It provides information on drug use trends from: injecting drug users who represent a sentinel group of illicit drug users; well informed key informants sampled in a systematic fashion; and brief, timely and comparable indicator data from a number of existing sources. A system based on the Drug Use Forecasting Program in the U.S. which collects urinalysis data from arrestees is to be trialed in Australia (DUMA) by the Australian Institute of Criminology. The IDRS continues to be refined and trialed in NSW, South Australia and Victoria, with a modified version to be introduced in the remaining States in 1999. More work is needed to integrate health and law enforcement data sets on illicit drug use in Australia; to utilise information technology in monitoring systems; and to establish the feasibility of linking early warning indicators to policy.

ANTECEDENTS AND RISK FACTORS FOR ILLICIT DRUG USE

Biological factors: Some research has been conducted on behavioural genetics and biological markers of alcohol use and abuse in twins, and on the prevalence of the dopamine D-2 receptor in persons with alcohol dependence. There has been very little research, however, on biological risk factors for illicit drug use in Australia. The following emerging issues have been identified: differential gene expression following acute and chronic exposure to drugs and alcohol; the development of new pharmacotherapies for the treatment of drug and alcohol craving; animal models of illicit drug use and dependence; and studies of the neural and behavioural consequences of long-term heavy MDMA use.

Psychosocial factors: The majority of studies in this area have examined risk factors for initiation of adolescent drug use, rather than problematic use. Most Australian studies have been cross-sectional surveys with a limited ability to control for other potentially important risk factors (eg. psychiatric disorders, familial drug abuse), and which have not distinguished between drug use and abuse. The Melbourne University Centre for Adolescent Health has initiated several longitudinal studies of representative samples of adolescents that will permit more studies of this type similar to those that have been carried out in the U.S. and New Zealand.

Contextual factors: It is still not possible to accurately predict who will become a substance abuser. Studies have not yet examined the influence of peers in the transition from drug use to abuse or the contributing effects of peer influences at different stages of development. Many studies have failed to demonstrate the specificity of familial effects because they do not

include comparison groups of parents with other chronic disorders. Issues that need more attention are the influence of media, fashion and law enforcement on drug use. Ethnography could be more widely applied to collect detailed information on contexts of drug use.

DRUG-RELATED HARMS

Mortality and morbidity: The NDS has funded two major analyses of drug-related mortality and morbidity. The quality of evidence on causal relationships between illicit drug use and health status is not as good as that for tobacco and alcohol, and probably underestimates the contribution of illicit drug use. Nevertheless, these methods are reasonable and provide a means of monitoring trends in drug-related morbidity and mortality. Further, the Australian Institute of Health and Welfare (AIHW) is currently revising aetiological fractions to improve estimates of the effect of illicit drugs on morbidity and mortality. The proposed national minimum data set for drug treatment clients will provide additional data on trends in drug dependence. Analyses of data from the National Survey of Mental Health and Well-Being (NSMHWB) will provide estimates of the population prevalence of the more common forms of illicit drug abuse and dependence in Australia, while the inclusion of the SF-36 in the Household Survey will complement data from the NSMHWB.

Adverse health and psychological effects

Cannabis: There has been limited research on the morbidity associated with cannabis use in Australia. A number of studies have been done on dependence symptoms and a limited range of adverse health effects in long-term cannabis users, both in the community, and seeking treatment for cannabis dependence. A series of studies has been conducted on the cognitive effects of regular cannabis use. More detailed analyses are planned of data on cannabis use disorders in the NSMHWB by NDARC staff. An emerging issue has been the relationship between cannabis use during adolescence and the development of psychotic symptoms and disorders. The Victorian government has funded research on this issue. The existence of links between cannabis use and juvenile crime, and treatment for adolescent cannabis abusers requires further research.

Opioids: There is ongoing research into non-fatal and fatal opioid overdoses in several Australian States. The 1998 Household Survey also collected data on the number of persons who had experienced or witnessed an overdose, as well as examining whether ambulance or other health professionals were called for assistance. Further research is required into: patterns of drug use prior to fatal overdose; ambulance and police responses to overdose; the distribution and effectiveness of naloxone as a way of reducing overdose deaths; overdose deaths among methadone clients; the occurrence of overdose among immediately released prisoners; standardisation of the coronial database so that overdose fatalities can be better monitored; and investigation of cognitive deficits in persons who have experienced non-fatal opioid overdoses.

Amphetamines: The best documented of the chronic effects of amphetamine use include the development of a dependence syndrome and amphetamine psychosis. Less well known are the effects of long-term amphetamine use on neuropsychological functioning, violent behaviour and the reproductive system. Further research is needed on the severity and

persistence of cognitive effects of chronic amphetamine use. The role of amphetamine use in violence and amphetamine psychosis requires more observational and ethnographic studies of heavy chronic users in their natural setting, and clinical studies of individuals who have experienced these effects.

Cocaine: Research on patterns of cocaine use in Australia conducted in the late 1980s and early 1990s found low levels of intermittent intranasal cocaine use that was associated with few problems. More recently, two studies of cocaine use and cocaine-related harms in Sydney on small samples of inner city users have identified high rates of injection-related complications and cocaine related morbidity. Larger surveys of cocaine users are required to estimate the prevalence of these harms and identify needs for intervention.

Other illicit drugs: The effects of MDMA and other stimulants may be exacerbated when they are used at dance parties, where the combination of excessive physical activity and overheating can be fatal. Several such cases have occurred in Australia. A survey of self-reported harms among several hundred MDMA users in Brisbane, Sydney and Melbourne revealed that a minority of young adults use the drug in a hazardous way, often in combination with other drugs. Some steroid users appear to be experiencing high rates of morbidity. The potential seriousness of these trends needs to be better assessed. The extent of sharing of injection equipment by those who inject AAS and ecstasy requires examination.

Blood-borne viruses: The evaluation of the National HIV/AIDS Strategy provided good data on the prevalence and incidence of HIV among IDU and on the cost effectiveness of syringe exchange as a way of preventing HIV infection. There has been only limited research on HCV incidence. The National Centre in HIV Epidemiology and Clinical Research continues to monitor HIV and HCV among IDUs. The limited data on the population incidence of HCV could be improved. Proposals have been made to monitor HCV incidence in NSW prisons, and to follow a cohort of HCV seropositive individuals to examine the factors associated with transmission and the nature of HCV-related risks. Little is known about the circumstances and predictors of transmission, and no data exist on the effectiveness of different interventions to prevent HCV transmission among IDUs nor effectively treat HCV positive individuals. Long term studies of injecting drug users would provide important information about the transmission and incidence of blood-borne viruses.

Other injection-related harms: Rare but potentially serious health complications of injecting impure drugs (such as abscesses, bacterial endocarditis and septicaemia) have been understudied, as have the vascular complications of injecting.

INTERVENTIONS TO REDUCE DRUG-RELATED HARMS

Primary prevention

Mass media: Mass media campaigns have been a part of the NDS, and a further one is proposed as part of the NIDS. There is a need to incorporate previous research on the effectiveness of mass media strategies into the design of future campaigns and to fund adequate evaluations of new campaigns.

School education: A number of Federal and State departments are examining the issue of school-based education on illicit drugs. There is a need to evaluate existing and planned drug education programs in schools that aim to prevent or delay cannabis and other illicit drug use among secondary school students.

Legislation: The deterrent role of legal sanctions for illicit drug use have rarely been studied. An exception has been work conducted over the past decade evaluating the impact of reducing the severity of legal penalties for cannabis use in South Australia on the prevalence of its use. Work has also been carried out examining the effect of South Australian and ACT liberalisation of cannabis legislation on the prevalence of cannabis use between 1985 and 1995 (using Household Survey data). The 1998 National Household Survey will examine this issue further. Emerging issues include the evaluation of legislative models and policing strategies on rates of cannabis use and cannabis-related offences.

Codes of practice for venues: National and State protocols for conducting safer dance parties and preventing drug-related problems have been developed in Australia. Generally, these recommend adequate provision of water, ventilation, chill-out areas and information to users. There are no plans to evaluate their impact on drug use and drug-related harm at dance party venues.

Secondary prevention

Information dissemination to drug users: The development and dissemination of information on drug-related harm has been a common response to community concern about illicit drug use. The Speedwise-Speedsafe campaign, for example, was implemented in several Australian States, and an intervention to reduce opioid overdose developed in South Australia is being introduced in several States. The impact of these interventions needs to be more rigorously evaluated. The effectiveness of peer-based education approaches is worthy of further investigation.

Self-help strategies: Self-help guides to quit or reduce drug use have been provided for users of various illicit drugs, such as, amphetamines, cannabis and steroids, but their impact has rarely been evaluated. A self-help guide for amphetamine users experiencing problems with their use is currently being evaluated in South Australia.

Needle exchanges: The NSEP survey has provided a snapshot of needle exchange clients for the last three years. The role of sharing injecting paraphernalia in the transmission of HCV needs to be examined, as do methods to reduce the risk of HCV transmission via environmental contamination. A qualitative study of the impact of replacing a fixed NSEP with a mobile one in western Sydney is underway.

Safe injecting rooms: Local data are scant on risk behaviour in illegal injecting rooms and there is limited overseas data on the impact of safe injecting rooms. Two Australian States are investigating the establishment of safe injecting rooms. A trial would answer many questions about the usefulness or otherwise of safe injecting rooms.

Tertiary prevention

Detoxification: A number of trials are examining alternative pharmacological agents for opioid detoxification, including the accelerated forms of withdrawal under sedation and general anaesthesia. Research is needed on the efficacy and patient acceptability of withdrawal agents other than methadone (e.g. buprenorphine, lofexidine, naltrexone), and the efficacy of non-pharmacological approaches for opioid and stimulant withdrawal. The role and prevalence of home-based detoxification needs to be investigated. Research is also needed on effective strategies for withdrawal from stimulants. The cost-effectiveness of different withdrawal intervention models could be evaluated.

Pharmacological treatments

Methadone: Research into low threshold methadone programs has been completed by Turning Point and DASC. The Commonwealth Department of Health is evaluating a pilot study of alternative funding mechanisms for MMT. Research on the impact of dispensing fees on the outcome of private methadone treatment is needed. The role of MMT in reducing HCV infection has yet to be evaluated. Research examining the effects of mainstreaming MMT in primary health services on client outcome and satisfaction is needed. The extent and consequences of methadone diversion needs more study, as does the effectiveness of strategies to reduce diversion.

Other pharmacotherapies for opioid dependence: A major study of the feasibility of prescribing heroin to opioid dependent persons was undertaken by NCEPH between 1991 and 1997. Controlled clinical trials of the effectiveness of a variety of alternative opioid maintenance drugs are underway in the ACT, NSW, Queensland, SA and Victoria. These include trials of: buprenorphine, LAAM, naltrexone and slow-release oral morphine maintenance, which will investigate patient outcome and patient acceptability of these agents.

Amphetamine substitution: A pilot trial of dexamphetamine prescription in Sydney is examining the feasibility of this treatment for amphetamine dependence. Controlled studies are needed to determine the efficacy of this treatment.

Cocaine substitution: There has been considerable interest in the U.S. in pharmacotherapies for cocaine dependence but no such work has been done in Australia, largely because of the low rate of problems experienced with this drug. Indications of harmful cocaine use among injecting drug users in Sydney suggests that such treatment may need to be considered.

Pharmacotherapies for benzodiazepine dependence: Benzodiazepine abuse, especially by injection, is widespread among heroin users and has been linked to higher levels of risk taking, poorer health and psychological functioning. A pilot trial of benzodiazepine maintenance using the long-acting clobazam among benzodiazepine dependent methadone clients has recently been completed by NDARC and the South West Area Health Service. It aims to determine the feasibility of this treatment in reducing the substantial harms associated with benzodiazepine abuse.

Psychological interventions

There have been no large scale Australian studies of psychological interventions like the CALDATA and DATOS studies in the U.S. and NTORS in the U.K. These studies provide an important bridge between the results of clinical trials and the effectiveness of such treatments as delivered under ordinary clinical conditions. Large scale multi-site outcome studies of the effectiveness of treatment modalities for illicit drug problems are desirable in Australia.

Cognitive behavioural: A number of randomised comparative studies have reported favourable results of cognitive behavioural interventions among illicit drug users. Cognitive behavioural techniques are gaining more currency as ancillary components of methadone maintenance and residential treatments, but there is little support for their use as stand alone treatments for opioid dependence. A trial of their effectiveness in treating cannabis dependence is nearing completion. The development of treatment protocols, programs for primary health professionals and treatment for special populations are all areas of importance.

Behavioural: Cocaine-dependent patients who received cue exposure integrated with standard treatment had a higher retention in outpatient treatment and more cocaine-free weeks than those who did not. Treatment involved repeated exposure to cues and situations in which the drug is used to reduce the intensity of craving that the user experiences. A recent Australian study has shown that amphetamine users also exhibit cue reactivity on which cue exposure treatment is based, suggesting that this may be a useful treatment strategy among amphetamine users.

Psychotherapy: There have been few controlled studies of the efficacy of psychotherapy for psychostimulant problems, although case reports suggest some success. Studies with opioid users have found that supportive-expressive psychotherapy is as effective as cognitive-behavioural techniques. There has been one Australian study comparing expressive-supportive psychotherapy with a brief intervention for cannabis dependence, but its results have not yet been published.

Therapeutic communities: Therapeutic communities (TCs) are an effective form of treatment for some illicit drug users. One of the few Australian studies in this area found (similar to the U.S.) that improved outcomes in a TC were associated with longer client retention and client attainment of different program levels. Program graduates also sustained improvements in the areas of employment, drug use and crime. Given the extent of community support and investment in these programs, they are deserving of more research.

Self help: Attendance at 12-step programs is a popular adjunct to treatment for alcohol, opioid and cocaine dependence. Evidence for the efficacy of self-help approaches for illicit drug use is lacking. With the exception of a study in Melbourne by Turning Point, there has been little research on the role and effectiveness of self-help groups in the treatment of opioid and other illicit drug dependence.

Acupuncture: There has been one single-blind study testing the effectiveness of acupuncture in the treatment of cocaine users. An extensive review of the effectiveness of treatment for drug problems in the U.K. found that acupuncture was commonly used among cocaine users, with staff perceiving it to be the most effective treatment modality. Well-controlled studies of acupuncture for opiate and stimulant withdrawal are needed.

Special populations

Youth: Because adolescent illicit drug users experience multiple problems, they require multi-faceted treatments that deal with cognitive, social and developmental issues. Cognitive behavioural interventions, skills training and family therapy appear promising and their effectiveness is currently being investigated in NSW. The opportunity should be taken to intervene with high-risk youth while incarcerated.

IDU: Two Australian randomised controlled trials of CBT have been conducted among IDUs. Both compared six sessions of a cognitive behavioural intervention with a one session motivational interview and showed some reduction in HIV risk-taking behaviour for the CBT group.

Women: There has been one evaluation of a specialist treatment service for alcohol and drug dependent women and an analysis of the needs of women who have been treated in existing services that primarily cater for men. Action on implementing guidelines from a national needs analysis project would be desirable. Studies of subgroups of women such as victims of abuse or neglect, females in custody, and rural women would be useful ways to develop appropriate interventions.

Indigenous Australians: There has been little research into the treatment of Indigenous Australian people with illicit drug problems. Given the high prevalence of these problems in this population, this is an area that requires urgent research.

C&LD populations: Research carried out among C&LD populations overseas suggests that several factors play a major role in determining the success of harm reduction efforts. There is a need for more research in this area to gain a better understanding of these factors, in addition to examining acculturation issues, and the role that is played by natural systems and therapies in addressing drug problems.

Prisoners: A randomised controlled trial of the NSW prison methadone program is currently being conducted. Plans to introduce prison methadone maintenance programs in two other Australian States provide further opportunities for evaluation. Bleach and condom programs have been evaluated in NSW prisons. Drug and alcohol counselling is the most common form of treatment offered to inmates but there have been no controlled studies of this treatment. Evidence has emerged from Europe that it is feasible to operate syringe exchange programs in prison but prison authorities in Australia have opposed its trial here.

Dually diagnosed: There is a high rate of anxiety and affective disorders among persons seeking treatment for illicit drug problems. Failure to treat these disorders may increase relapse to drug use. Most research into "dual diagnosis" has been on persons with psychoses who have drug and alcohol problems. More needs to be done to improve the early detection and management of anxiety and affective disorders in persons seeking treatment for illicit drug problems.

Economic appraisal of illicit drug interventions

Two major estimates have been made of the economic costs of alcohol, tobacco and illicit drug use in Australia, and an estimate has been made of the health care costs of hepatitis C virus infection among IDUs. Much less work has been done on the cost-effectiveness of specific interventions to reduce illicit drug related harm, however estimates of the cost-effectiveness of syringe exchange programs and methadone maintenance treatment have been completed. There is scope for undertaking studies of the cost-effectiveness of new pharmacotherapies and residential drug-free treatment programs.

OVERVIEW

Epidemiology

There has been a major investment in research on the epidemiology of the more common types of illicit drug use (such as cannabis use) in the form of NDS household and school surveys. Data on drugs used by a small percentage of the population are less useful. However, greater detail in the questions addressing illicit drug use, and the increase in the number of IDUs in future NDS surveys, will improve the data. These surveys have been supplemented by detailed studies of patterns of drug use in convenience samples of regular illicit drug users, including injecting drug users. It has been relatively inexpensive to investigate convenience samples of such drug users to provide timely data on issues of public concern. Better measures to estimate the size of the injecting drug user population are still needed, as are long-term cohort studies of IDU and studies of high risk populations (eg. Indigenous Australians, persons from some C&LD populations).

Risk Factors

Research into the biological, social and contextual risk factors for drug use initiation, persistence and the development of dependence has not been a major area of research in Australia. The NH&MRC has funded behavioural genetic research on alcohol use but very little has been done on illicit drug use because of its lower prevalence in the community and twin samples. There has been an under-investment in research on psychosocial risk factors in comparison with the U.S. and New Zealand. More opportunity could be taken to analyse data on drug use in cohort studies of adolescents conducted in Melbourne. The under-investment in research on biological risk factors is defensible, given the expertise and infrastructure required for such research and the competition for scarce research resources, when much of this work would be replicating work done in the U.S. Ethnography could be more widely applied to explore detailed contexts of drug use in Australia.

Harms

In the past decade Australia has developed a strong tradition of high quality epidemiological research on mortality and morbidity attributable to alcohol, tobacco and illicit drug use. This has included meta-analyses of the international literature to identify probable causal relationships between different types of drug use and harms, and to quantify the amount of mortality and morbidity in Australia attributable to different types of drug use. This work has been internationally recognised and its results have informed the work undertaken by WHO and the World Bank on the Global Burden of Disease.

There has also been a strong tradition of epidemiological research on injecting drug use in Australia. Most of this has been prompted by concerns about infectious disease transmission through syringe sharing, initially on HIV, and more recently HCV. Although much more remains to be done, in this field Australia is well ahead of many comparable European countries in its knowledge of the prevalence and incidence of HIV and perhaps also HCV, and in the relative effectiveness of the interventions commonly used to prevent infectious disease transmission by injecting drug use.

More recently, Australian research on fatal and non-fatal opioid overdose (including methadone overdose) has attracted international interest. Australian work on non-fatal overdoses has been replicated internationally, and it has prompted work on the prevention of opioid overdoses in Europe. There has been similar interest on a smaller scale in Australian research on the prevalence and correlates of injecting amphetamine use and long-term cannabis use.

Interventions

There has been a preponderance of Australian research on the effectiveness and safety of pharmacological interventions for opioid dependence. This has been prompted by the continuing demand for these types of treatments over the past decade, the magnitude of the public health threat posed by opioid dependence as a risk factor for premature death from overdose and infectious disease, the scale of public investment in providing this type of treatment, and the continuing controversy about the legitimacy, effectiveness and safety of maintenance treatment. The scale and coherence of research on methadone maintenance has attracted international interest, as has research into the feasibility of heroin prescribing.

There has been much less research on interventions for persons experiencing problems with other types of illicit drug use, such as, the amphetamines, benzodiazepines and cannabis. This reflects the lower demand for treatment from persons with these problems by comparison with opioid dependence. Many people with these problems are also dependent on opioids, which is understandably given a higher treatment priority. However, there appears to be a growing need for interventions for dependent cannabis and stimulant users.

There has been little research on psychological interventions for illicit drug dependence, whether this includes more traditional 12-step based self-help approaches, residential and therapeutic communities, or the newer forms of behavioural and cognitive behavioural treatments.

International Impact

Australia cannot hope to match the level of investment in research on illicit drugs in the U.S., which accounts for most of the research on this topic in the international literature. Nevertheless, by comparison with the modest scale of its investment, Australia has been an over-achiever in the field of illicit drug research, as measured by rate of publication in the leading journal *Addiction*, and by the involvement of Australian researchers in World Health Organisation committees on illicit drug epidemiology, treatment and policy.

Australian research has not covered all fields of illicit drug research (with biological research a conspicuous omission), but Australian researchers have achieved a high profile in the fields that reflect Australian community concerns about illicit drug use, and which have been translated into research funding. As indicated above, these include research in: the epidemiology of injecting drug use and illicit drug use more generally; epidemiological analyses of mortality and morbidity attributable to illicit drug use; studies of specific harms related to illicit drug use, such as opioid overdose death; the role of injecting drug use in transmission of infectious diseases; and the evaluation of methadone maintenance and new pharmacotherapies in the treatment of opioid dependence.

1.0 INTRODUCTION

The Strategic Research Development Committee (SRDC) of the National Health and Medical Research Council (NH&MRC) has been allocated approximately \$4,000,000 over four years through the National Illicit Drugs Strategy (NIDS) to fund research on illicit drugs in Australia. The SRDC commissioned this scoping document to provide an overview of the current status of research to inform a workshop that would identify funding priorities. This document:

- i provides an overview of the key domains of research into illicit drugs undertaken over the past 10 years in Australia;
- ii summarises findings of major reviews of research on illicit drugs from Australia and elsewhere;
- iii compiles a list of existing research projects funded through the major national and State funding bodies, drug research centres and other government initiatives;
- iv identifies emerging areas of interest in illicit drugs research of particular relevance to Australia.

There have been some previous formal attempts to prioritise research on alcohol and other drugs in Australia, through reviews of the literature and/or consultation with researchers working in the field (eg. Ali, Miller & Cormack, 1992; Walsh, Low & Sanson-Fisher, 1998; Hawks & Heather, 1991; Loxley, Ovendon, Hawks & Somerville, 1992). Most of these have occurred prior to 1993. Given the dynamic nature of the illicit drug market, and developments in interventions to reduce illicit drug problems, there is a need to revise our current knowledge of illicit drugs and prioritise future directions.

2.0 METHODOLOGY

Research was classified into the following four key research domains:

1. the epidemiology of illicit drug use, which includes research on the prevalence and patterns of illicit drug use among the general and special populations;
2. risk factors for illicit drug use including biological, psychosocial, and contextual factors;
3. drug-related harms including mortality and adverse health and psychological effects;
4. the evaluation of interventions to reduce drug-related harms, including primary, secondary and tertiary health interventions.

The report summarises Australian research over the past 10 years in each of these research domains, drawing primarily on major Australian and overseas review papers, plus some references on individual research projects when reviews were limited or not available. The literature was identified by: (1) searches of drug-specific library databases (ADCA, NDARC); (2) searches of the main journals in which Australian researchers publish their work (*Addiction*, *Drug and Alcohol Review*, *Medical Journal of Australia*); and (3) suggestions by key researchers working in the drug field. The bibliography has been ordered

according to the four key research domains, and does not represent a comprehensive list of publications on illicit drug research.

Drug specific information is broken down by the four main illicit drugs: cannabis, heroin, amphetamines and cocaine, and other illicit drugs where relevant. Special consideration is given to the priority groups identified by the National Drug Strategy (NDS), that is, Indigenous Australians, prisoners, women, injecting drug users, persons from C&LD populations and youth (NDS Committee, 1993). While it is acknowledged that law enforcement and legislation can impact upon the health of illicit drug users, this topic was considered to be outside the scope of the present NH&MRC document, although details of prison initiatives and the Cannabis Expiation Notice System have been included. Other areas not covered are the evaluation of policy initiatives such as the National Drug Strategy (eg. Single & Rohl, 1997), and the effective dissemination of research.

A commentary on research quality is provided where appropriate, as are details of emerging areas of interest and research priorities in illicit drug research in Australia, the latter of which are derived from the literature and researchers working in the field (see below). Details of some of the research activities currently in progress are provided throughout the document, and summarised more fully in Appendix B. While this report attempts a comprehensive review of illicit drug research in Australia (and elsewhere), it is limited by the short time interval in which the project was conducted.

A brief questionnaire was completed by 29 key stakeholders (listed in Appendix A) who were defined as researchers currently active in the field of illicit drug research, who had published and/or obtained funds to conduct research during the previous two years. Non-researchers were not included due to the emphasis on published research (where possible) and evidence-based issues in the present document. The questionnaire asked stakeholders to reference two major Australian and overseas reviews in their area of expertise, and up to five additional key articles not included in these review papers. They were also asked to identify emerging areas of interest and research priorities and asked if they would be able to comment on the scoping document prior to its completion. In addition, stakeholders were asked to nominate two other Australian experts in their area to ensure that stakeholders were adequately sampled. Some stakeholders completed surveys in more than one area. A number of potential stakeholders were unable to be contacted during the study period. However, some of these stakeholders were able to provide comments on a draft of the document (see Appendix A).

Brief funding details of current research projects on illicit drugs were sought from the major funding bodies, national and State drug research centres and other government initiatives. Organisations were asked to provide details of: the project name, the host institution, the funding source, the total funds awarded, the actual years the project was funded, and collaborators (optional). This information was drawn from official annual reports and other records (Appendix B). Some organisations were unable to provide this information in the specified time. Funding details are summarised by the four key research domains noted above.

3.0 EPIDEMIOLOGY OF ILLICIT DRUG USE IN AUSTRALIA

3.1 PREVALENCE AND PATTERNS OF ILLICIT DRUG USE AMONG THE GENERAL POPULATION

The National Drug Strategy (NDS) commissioned four national household surveys of substance use between 1988 and 1995 which showed that, apart from cannabis, illicit drug use in Australia remained at low levels (CDHFS, 1996). Marijuana was the most common illicit drug used in Australia, with almost one in three persons aged 14 and over having ever tried it. Amphetamines remain the second most popular illicit drug in Australia: 6-8% of the general population have used it at some time, several times higher than the proportion who have used cocaine (2-3%) or heroin (1-2%).

Detailed analyses of this data (Makkai & McAllister, 1998) indicate that the lifetime and annual use of marijuana use has increased since 1988, although the frequency of marijuana use has declined. Those who use marijuana are more likely to be male, young, and born in Australia/New Zealand or the British Isles. Annual prevalence shows few variations based on education and is higher among the unemployed.

Lifetime prevalence of amphetamine use has increased since the late 1980s, although use in the previous year remained constant (Makkai & McAllister, 1998). Those who use amphetamines are more likely to be male, to be aged in their 20s and to have a manual job or be unemployed. The lifetime rate of hallucinogen use has remained stable over time. Hallucinogen users are likely to be aged in their 20s and 30s, to be male, and to be unemployed. Specific patterns of other types of illicit drug use are not discussed due to low prevalence estimates.

Data quality:

- While this data provides a general picture of illicit drug use in the community, they are limited in describing the prevalence of illicit drug use with low base rates, such as heroin and cocaine. However, the sample size for the 1998 survey has been increased to 10,000 and a range of sampling methods will be used and compared, to improve the dataset. The extent of capture of illicit drug users is yet to be reported but the researchers predict that there will be in excess of 250 respondents who have ever injected and approximately 100 respondents who are current injecting drug users.

Current status:

- Data collection for the 1998 national household survey is underway.

Emerging issues:

- The issue of a low base rate of most forms of illicit drug use in the household surveys may not be resolved through variations in the methodology. Research into the development of additional measures is needed to estimate the prevalence and patterns of heroin use in the community. This could be achieved through capture-recapture methods and surveillance systems (see also Larson & Bammer, 1996).

3.2 PREVALENCE AND PATTERNS OF ILLICIT DRUG USE AMONG SPECIAL POPULATIONS

3.2.1 YOUTH

Few comprehensive, up-to-date reviews exist in this area, other than a report commissioned by the Commonwealth Department of Health and Family Services that examined gender differences in youth drug use (McCallum, 1998). Surveys of secondary school students in several Australian States during the past decade have collected information on illicit drug use. These report similar patterns of illicit drug use as in the household survey. For example, the 1992 NSW survey of 3,828 secondary school students found that 25% had tried cannabis (30% males, 21% females), 31% had used inhalants (eg. sniffing petrol, glue), 7% had used stimulants (includes cocaine and amphetamines), 7% had used hallucinogens, and 4% narcotics (Cooney, Dobbinson & Flaherty, 1994). Significant increases in the proportion of NSW students who had ever tried cannabis and who had used it on a regular basis were reported between 1989 and 1992. Boys reported higher lifetime and regular rates of cannabis use than girls. Inhalant use also rose, and was more prevalent among younger students of both sexes. Significant increases in hallucinogen use among boys were noted, but there were no changes in stimulant or narcotic use. Preliminary results from the 1996 NSW secondary school survey suggest further increases in cannabis use (NSW Health Department, 1998). Results from a national survey conducted by the Victorian Anti-Cancer Council have not yet been released.

Limited information on illicit drug use among students in post-secondary training courses has also been collected. In 1992, the proportion of 3,489 post-secondary school Technical and Further Education (TAFE) students (aged 16 to 25) who had ever tried stimulants ranged from 14-19% for males and 10-20% for females, 45-58% had used cannabis, 11-16% used inhalants, 13-21% hallucinogens, and 3-6% opiates (Keys Young, 1993). This survey was repeated in 1996 but detailed results have not yet been released.

There has been one general survey of young illicit drug users since 1988 (Spooner, Flaherty & Homel, 1993) which repeated an earlier street intercept survey conducted in 1986 (Reilly & Homel, 1988). Spooner *et al.* (1993) interviewed 581 recreational drug users (aged 16-21 years) who were contacted in public places around Sydney such as beaches and shopping centres. Their sample included only respondents who had used illicit drugs other than cannabis. The prevalence of illicit drug use was accordingly high: 98% of the sample had used cannabis, 75% had tried amphetamines and 40% had tried cocaine. While participants tended to be polydrug users, they were less likely to use opioids (25%).

More recent research collected by the Illicit Drug Reporting System (IDRS; see section 3.3) suggests an increase in the use of opioids among young people (Maher, 1996; Hando, O'Brien, Darke *et al.*, 1997; Hando, Darke, Degenhardt *et al.*, 1998). It noted a lower mean age of heroin injectors and more younger heroin users entering the Sydney market during 1995-97, patterns confirmed by both quantitative and qualitative research methods. A substantial amount of regular heroin use among adolescents in treatment (mean age 16 years) has also recently been noted (Spooner, Mattick & Noffs, 1998).

Data quality:

- These surveys provide useful indicators of illicit drug use among school and non-school

populations of youth, which complement data from specialist studies.

- There is a lack of detailed questions on illicit drug use in the national secondary school survey (eg. on route of administration).

Current status:

- Results from the first national survey of drug use among secondary school students conducted in 1996 have not yet been released, although there are plans to repeat this survey in 1999.
- Results from the 1996 TAFE survey of drug use in NSW have just been released.
- Several States are currently investigating the feasibility of establishing a system to monitor youth illicit drug use (eg. NSW Health Department Information and Development Unit).

Emerging issues:

- Delays in the release of school and TAFE survey data may prevent the development of interventions to reduce problematic drug use among these populations. The timely release of data independent of the political process is desirable.
- The regular collection of national secondary school survey data on illicit drug use, as in the Monitoring the Future project (U.S.), is desirable to monitor illicit drug use trends in adolescents.
- Increased cannabis and possibly heroin use among youth.
- More studies using targeted sampling methods and qualitative studies of subcultures of drug using youth are needed.

3.2.2 INJECTING DRUG USERS

The National Survey of Mental Health and Well-Being (NSMHWB) and the NDS Household Survey both found one percent of adults reported injecting drugs in the previous 12 months (Hall, Teesson, Lynskey & Degenhardt, 1998; Makkai & McAllister, 1998). Australian estimates placed the number of regular and occasional IDUs at 100,000 and 175,000, respectively, in 1997 (ANCARD, 1998). The estimated number of IDUs in NSW has ranged from 15,082 in 1992 (Kehoe, Hall & Mant, 1992) to 62,650 in 1996 (Joint Select Committee into Safe Injecting Rooms, 1998). Within NSW, the number of IDUs in the 17 Area Health Services in NSW was estimated on a population basis. The largest concentration of IDUs, 13,654, resided in the South Eastern Sydney Area Health Region.

Two major national surveys of injecting drug users were conducted in 1988 and 1995, ANAIDUS (ANAIDUS, 1991) and ASHIDU (Loxley, Carruthers & Bevan, 1995). The typical ASHIDU respondent was a 28 year old male who left school early, was unemployed and started injecting at age 18. The first drug injected was just as likely to be amphetamines as heroin. Sixty percent had shifted from non-injecting to injecting a drug. One in six made a shift in the opposite direction, usually because of problems with veins. One third had been in prison.

IDUs attending selected needle and syringe exchange programs (NSEP) in several States/Territories have been surveyed in 1995, 1996 and 1997. For one week all exchange attenders are asked to complete a brief questionnaire and provide fingerprick blood samples which are tested for HIV and HCV antibodies (MacDonald, 1997). Heroin is the most commonly injected drug in Australia. The median age of first injection is 18 years.

Loxley and colleagues (Loxley, Marsh and Lo, 1991; see also Loxley, Bevan & Carruthers, 1997; Loxley, 1998) analysed the Perth ANAIDUS data by age and found that more younger users had used amphetamines and amphetamine analogues such as MDMA, and were more likely to inject amphetamines. Younger users were also more likely to have started injecting at a younger age, have injected other drugs and have more sexual partners, and less likely to have been in treatment than older users.

Recent research has also been carried out with injecting drug users with minimal contact with treatment agencies (the 'Fitpack' study; Lenton & Tan-Quigley, 1997). Research has been carried out in Cairns on a sample of rural IDUs using a multi-method approach, and involving a substudy of Indigenous Australian IDUs (Spooner, Bishop, Parr *et al.*, 1996). There has been one major longitudinal, field-based study of injecting drug users conducted so far in Australia (Crofts & Aitken, 1997).

Other research has examined transitions between routes of administration for several drug classes (eg. Darke, Cohen, Ross *et al.*, 1994; Ross, Darke & Hall, 1997; Swift, Maher, Sunjic & Doan, 1997) and initiation to injecting (Crofts, Louie, Rosenthal & Jolley, 1996; Maher, Dixon, Lynskey & Hall, 1998).

Data quality:

- The consistency across the studies and the corroboration of self-report by urinalysis results, collateral reports and criminal and other records, suggests that data quality and validity is reasonable (Darke, 1998).
- The quality of the NSEP data is good as it provides response rates and trends over time.
- We still do not have any well-recognised and nationally supported estimates of the number of illicit drug users in Australia.

Current status:

- NSEP surveys are repeated annually and now include New Zealand.
- National Centre in HIV Epidemiology and Clinical Research have started surveillance of new and existing methadone clients.

Emerging issues:

- Further work is needed on estimating the size of the IDU population.
- Factors influencing initiation to injecting.
- The injecting drug practices and risk taking behaviours of IDUs not reached by treatment agencies or peer-recruited research (ie. hidden populations).
- Long-term cohort studies of IDU.

- Characteristics and consequences of polydrug use among IDU.

3.2.3 USERS OF SPECIFIC ILLICIT SUBSTANCES

3.2.3.1 *Cannabis*

Donnelly & Hall (1994) analysed data from population and other probability surveys on cannabis consumption patterns. Findings from both population and school surveys suggest an upward trend in the lifetime prevalence of cannabis use since the mid 1980s (Donnelly & Hall, 1994; see also section 3.1). Makkai & McAllister's (1997) more recent analyses of cannabis use in household and other surveys support these findings. An examination of overseas research shows that cannabis is used by a substantial minority, and in some cases a majority, of young adults in many Western countries (Hall, Johnston & Donnelly, 1998).

There have been two recent Australian studies of long-term cannabis users in rural and urban areas (Swift, Hall & Copeland, in press; Reilly, Didcott, Swift & Hall, 1998). The typical cannabis users in these studies were men and women in their late 20s (the urban sample) or in their 30s (the rural sample) who were well educated and had similar employment rates as the general population. They had used cannabis at least weekly for 10 years or more, primarily in social situations for similar reasons to those for which alcohol is used in the wider community.

An emerging issue around cannabis use involves changes in its potency. Results from participants in the IDRS suggest that potency has strengthened in recent years, although cannabis samples are not systematically analysed. It is unclear how changes in cannabis potency affect patterns of consumption and related harms.

Important information on the natural history of cannabis use has been obtained from longitudinal studies in the U.S. and New Zealand (eg. Chen & Kandel, 1995; Lynskey, 1998) but there have been few longitudinal studies conducted in Australia. An exception is a study by Swift and colleagues (Swift, Hall & Copeland, 1998) who conducted a one year follow-up of long-term cannabis users in Sydney. Other data on cannabis use has been collected in a six wave State-wide cohort study of adolescent health in Victoria (Patton, Carlin, Coffey *et al.*, 1998) but has not yet been analysed.

Current status:

- Data on cannabis consumption patterns will continue to be collected in household and school surveys but there are no plans for studies of cannabis users in the community.
- There are plans to analyse longitudinal data in this area.

Emerging issues:

- A continued increase in the prevalence of cannabis use among young adults in Australia.
- Data on cannabis potency needs to be regularly analysed.
- Longitudinal studies could examine the natural history and consequences of cannabis use by adolescents.

3.2.3.2 *Heroin*

An increase in heroin use in Australia during the past few years is suggested by: an increase in the numbers and amounts of heroin seized by customs and police; an increase in demand for methadone maintenance and other forms of treatment for heroin dependence; and a six fold increase in the rate of fatal opioid overdose since 1979 (Lynskey & Hall, 1998a).

There have been several specific studies of patterns of drug use and correlates of harm among methadone clients, heroin injectors and heroin smokers conducted since 1988. The typical profile of a heroin user has until recently been a Caucasian male in their early 30s (eg. Darke, Ross & Hall, 1996). There is some evidence from the IDRS, general population figures and specialist studies that heroin users are becoming younger, with more females, and more users from ethnically diverse backgrounds (Maher, 1996; Hando, O'Brien, Darke *et al.*, 1997; Maher *et al.*, 1998; Lynskey & Hall, 1998b). Ethnographic research in southwest Sydney has identified a new cohort of younger Indo-Chinese heroin users (Maher, 1996; Maher *et al.*, 1998). Decentralisation of the heroin market from Cabramatta in southwest Sydney to surrounding areas has been documented by the IDRS in recent years (Hando, Darke, Degenhardt *et al.*, 1998; R. McKetin, personal communication, 1998).

A major change in heroin use in recent years has been in route of administration. Australian and overseas research has documented a diffusion of non-injecting routes of administration, particularly among Indo-Chinese populations in Australia (Maher & Swift, 1997; Swift *et al.*, 1997; Strang, Bearn, Farrell *et al.*, 1998). Preliminary results from the most recent IDRS have noted increases in heroin smoking, and in transitions from heroin smoking to injection throughout Sydney among Caucasian heroin users (McKetin, Darke & Godycka-Cwirko, 1998). Studies also report consistent polydrug use among heroin users in Australia (eg. Darke & Hall, 1995).

Current status:

- There is ongoing ethnographic and quantitative research into heroin use in south-west Sydney and inner city Melbourne.

Emerging issues:

- Changing features of heroin use, including demographics and routes of administration.
- Expansion of the heroin market in Australia.
- The influence of the changing characteristics of the heroin market (such as reductions in price, increased purity of heroin) on patterns of use and harm, and on the use of other drugs.

3.2.3.3 *Amphetamines*

Australian surveys of the general population and young recreational drug users show that amphetamine has remained the most commonly used illicit drug after cannabis, and tends to be used by young males in their 20s and 30s (Hando, 1997; Hando & Hall, 1997). About half of those in the general population who have tried amphetamines continue to use the drug.

Studies of injecting drug users have found that a substantial minority inject amphetamines. Amphetamine use is also prevalent among prisoners, street youth and sex workers (Hando, 1997).

There have been several special purpose studies of amphetamine users conducted since the early 1990s (Hando, 1997). These showed that amphetamines are used by a heterogeneous group of young adults, mainly for recreational purposes (e.g. to get high, for energy, to have fun and to party). Variable quantities and frequencies of amphetamine use were reported. While most amphetamine users first administered the drug by oral or intranasal routes, over half of them made a transition to injection, usually in their late teens. Amphetamine injectors tended to be more socially disadvantaged and participate in more hazardous forms of drug use, compared to non-injectors. Polydrug use was another common feature among the samples (Hando, 1997).

There is mixed evidence of trends in amphetamine use in Australia. Indicators which suggest a downward trend in amphetamine use include: evidence that some regular users are switching from amphetamine to heroin injection; a slight decline in the proportion of the Australian general population who had been offered and who had used amphetamines; and an increase in the number of amphetamine users at treatment agencies seeking to reduce their amphetamine use. However, other indicators show a continuing popularity of amphetamines, particularly by injection. This is despite tighter restrictions on the availability of the precursor chemicals used to manufacture amphetamines and problematic amphetamine use now being experienced by mature users. Research suggests that this may be occurring among new generations of amphetamine users who are entering the market, as the average age of amphetamine users has remained stable over the past five years, and a continuation of new recruits to amphetamine injecting has also been noted. A recent study specifically examining transitions from amphetamine to heroin injecting found considerable movement between amphetamine and heroin injection, with heroin use not necessarily a stable end point for injecting careers (Darke, Kaye and Ross, 1998).

Current status:

- No current research into patterns of amphetamine use.

Emerging issues:

- The development of interventions to reduce transitions to injecting amphetamine use.

3.2.3.4 Cocaine

Hall & Hando (1993) note that most of the Australian research on cocaine was conducted during the mid to late 1980s, when there were concerns that a cocaine epidemic would occur among Australian recreational drug users, similar to that among U.S. drug users during this time. Research revealed that while cocaine use was reasonably common among recreational and injecting drug users, it usually occurred at an infrequent level in a context of extensive polydrug use (Hall, Carless, Homel *et al*, 1991; Mugford and Cohen, 1989). Few cocaine users were either arrested or presented to treatment with a primary cocaine problem.

Two more recent studies suggest changes in cocaine consumption patterns in Sydney. A study for the World Health Organisation that used a combination of qualitative and quantitative research methods found increased cocaine use among inner Sydney injecting drug users, especially those from lower socio-economic groups, such as sex workers, methadone clients and heroin injectors (Hando, Flaherty & Rutter, 1997). This finding was confirmed by a study of cocaine injectors in Kings Cross (Malcolm, Armstrong, Miles *et al.*, 1996). There have also been indications of larger police seizures of cocaine, reflecting a possible increase in availability (Hando, Flaherty & Rutter, 1997).

Results from the IDRS suggest a further expansion of cocaine use in Sydney, especially in the south west and west. This is confirmed by other unpublished survey data (L. Maher, personal communication, 1998). Increased cocaine use among urban Indigenous populations has also been noted by the IDRS. Powder cocaine continues to be the most common form of cocaine used in Australia, with few reports of crack-cocaine. Reports of cocaine becoming cheaper and more affordable by being packaged in smaller, more convenient amounts have continued since 1993, particularly in inner Sydney (McKetin *et al.*, 1998; Hando, Flaherty & Rutter, 1997).

Current status:

- No research is being conducted on cocaine use patterns.

Emerging issues:

- Increases in cocaine use and availability require further investigation, including changes in the demographic characteristics of users.
- Intravenous use of cocaine by heroin users often as “speedballs” (cocaine and heroin).

3.2.3.5 *Other illicit drugs*

A recent survey of ecstasy use in three States (Topp, Hando, Degenhardt *et al.*, 1998) suggests that patterns of ecstasy use may be changing. Ecstasy users were young, relatively well educated and mostly employed or students (see also Lenton, Boys & Norcross, 1997). Extensive polydrug use was the norm, and substantial minorities reported injecting ecstasy. More varied features of use were noted compared to a previous survey in Sydney (Solowij, Hall & Lee, 1992).

There are indications that the use of anabolic-androgenic steroids (AAS) is increasing in Australia and overseas (Peters, Copeland & Dillon, in press). A recent Sydney study interviewed 100 AAS users who were typically male, well educated, employed and had a higher disposable income than the general population (Peters *et al.*, in press). They were also involved in rigorous training directly related to their AAS use. Recreational drug use was low, except among gay AAS users. Research has also been conducted in other States including Western Australia, with the finding that AAS use is common among groups who attend gyms or who are involved in fitness recreationally or as part of their occupation (e.g.

Beel, 1996; Beel, Maycock & McLean, 1998; Chee, Kuan, Rynn & Teoh, 1995; Plowright, 1993).

Current status:

- No current projects known.

Emerging issues:

- Changing features of ecstasy use, including injecting practices.
- Steroid use among adolescent, women, gay and rural populations, including extent of use and related harms.
- Sharing of injection equipment by ecstasy and AAS users.
- Polydrug use eg. drug combinations which are fatal.

3.2.4 WOMEN

In Australia, data from the 1985-95 NDS household surveys show that males are more likely than females to report lifetime use of all illicit drugs and to have injected (Makkai & McAllister, 1998). While women run the risk of developing substance dependence problems at around half the rate of men, the proportion of women attending treatment services for substance problems is much lower than this (Swift, Copeland & Hall, 1996). There is some evidence that women may be over-represented in treatment for opiate dependence and in adolescent services (Copeland & Hall, 1995). In any case, the majority of research in the drug and alcohol field is still on men (Copeland, 1995; Swift *et al.*, 1996). There has been some Australian research during the 1990s specifically examining alcohol and drug issues among women in treatment (reviewed in section 6.3.5.1), although little research among non-treatment populations, other than that collected in specialist surveys of other populations.

There have been a number of national conferences (Copeland & Swift, 1994; Frank, 1991), and literature reviews of gender differences in the psychological, physiological and social aspects of substance use and dependence, and the provision of treatment services for women (Copeland & Hall, 1995; ADF, 1992; Basili & Zador, 1995; Cormack & Smith, 1988).

Data quality:

- While women are still generally under-represented in studies on illicit drug use, this may partly reflect their lower prevalence of drug use as indicated by the NDS household surveys. However, researchers should still be encouraged to recruit women into their studies, and to analyse and report gender differences in their data (Copeland & Hall, 1995).

Current status:

- No current projects examining women with drug and alcohol problems.

Emerging issues:

- There has been little recent attention given to gender issues in the drug field.
- Anti-depressant misuse and dependence requires investigation.
- Benzodiazepine use among high risk populations of young women.

3.2.5 INDIGENOUS AUSTRALIANS

Few studies on Indigenous Australian substance use have focused specifically on illicit drugs. Most research has been on the use of alcohol, tobacco, analgesics, petrol sniffing and other inhalants. An Indigenous Australian supplement to the NDS Household Survey in 1994 (CDHSH, 1994) found a higher prevalence of lifetime and past year illicit drug use among urban Indigenous Australians compared to the general population (lifetime: 50% vs. 38%; past year: 24% vs. 15%, respectively), which was largely marijuana use (lifetime: 48%; past year: 22%). Similar figures were noted in a probability sample survey in NSW (Perkins, Sanson-Fisher, Blunden *et al.*, 1994; see also Gray & Morfitt, 1996).

Consistently low levels of petrol sniffing have been found (2-6%) among Indigenous Australian populations across Australia, but it is more common in remote areas of Australia, where other substances are not readily available. The toxic effects of chronic petrol use are extreme. Ethnographic research of petrol sniffing among indigenous Australian adolescents shows it to be a major concern in many Indigenous Australian communities (Brady, 1992).

The NDS household survey found that 3% of the Indigenous Australian population had ever injected drugs. National surveys of injecting drug users (MacDonald, Wodak, Ali *et al.*, 1997; Loxley *et al.*, 1995) have consistently found a minority (5% in both studies) of Indigenous Australian IDUs. Studies of Indigenous Australian IDUs in Brisbane and South Australia report that amphetamines is the most common drug injected, followed by heroin (Larson, 1996; Shoobridge, 1997). Recent findings from the IDRS suggest that 75% of a sample of Indigenous Australian IDUs in inner city Sydney used cocaine, a higher proportion than the total inner city sample (57%); they also used cocaine significantly more often than other IDUs sampled (Rebecca McKetin, personal communication, 1998).

The recent studies by Larson (1996) and Shoobridge (1997) have noted the importance of understanding harms associated with illicit and injecting drug use within the regional, social and cultural context of the Indigenous Australian communities. Shoobridge found that less than half of the Indigenous Australian IDUs participating in her study always used new injecting equipment, reflecting cultural beliefs and pressures on needle sharing practices. She recommended that innovative and culturally appropriate initiatives similar to those used for alcohol and petrol abuse be developed to reduce drug-related harm (see Gracey, 1998).

Data quality:

- The Indigenous Australian supplement to the NDS Household Survey provides the best prevalence assessment of urban Indigenous Australian drug use, but most population surveys include too few Indigenous Australian respondents to estimate their drug use.

Current status:

- A needs assessment of Indigenous Australian injecting drug users in SA is being conducted by NCETA.
- Victorian Aboriginal Health Service has recently completed a needs assessment and analysis of injecting drug use among the Victorian ATSI community.

Emerging issues:

- Injecting drug use among urban and rural Indigenous Australian populations and associated harms, such as blood borne viral infections and overdoses.
- A repeat of the NDS Indigenous supplement to the household survey conducted in 1994 would be useful in monitoring trends in illicit drug use, with enhancement to include rural communities.
- The spread of volatile solvent use to northern Queensland and rural NSW
- Impact of recent Federal and Northern Territory restrictions on the importation and use of kava.
- Implications of polydrug use among Indigenous Australian communities.

3.2.6 PERSONS FROM CULTURALLY AND LINGUISTICALLY DIVERSE BACKGROUNDS

Spathopoulos & Bertram (1991) note that data on drug use among persons of non-English-speaking background is limited and problematic, with a lack of consistency in methodologies and in definitions of specific cultural groups. The bulk of the research focuses on the use of licit substances. They find suggestive evidence from qualitative and anecdotal sources of potentially hazardous drug use among sections of the Greek, Turkish, Lebanese and Vietnamese communities, and note the importance of understanding substance use in the country of origin for C&LD populations.

Since 1991, a series of surveys auspiced by DAMEC using cluster sampling have been conducted in Sydney among the Vietnamese, Spanish, Greek, Chinese, Arabic and Italian communities (Bertram & Flaherty, 1992, 1993; Everingham, Martin & Flaherty, 1994; Everingham & Flaherty, 1995; Jukic, Pino & Flaherty, 1995, 1996). These indicate a lower prevalence of illicit and injecting drug use in these C&LD communities than in the general population. It was thought, however, that these rates were underestimates. Furthermore, illicit drug use among more recently arrived populations suggests the need for additional research involving these groups. The 1998 NDS household survey captured approximately 1,000 C&LD persons, which should enable some broad baseline data on illicit drug use. Analyses of pooled NDS household survey data have been carried out by Makkai and McAllister (1998).

Ethnographic and survey research conducted during the past few years among Indo-Chinese heroin users in southwest Sydney (Maher and Swift, 1997) and Vietnamese speaking injecting drug users in Melbourne (Louie, Krouskos, Gonzalez & Crofts, 1998) have reported a high prevalence of heroin use among pockets of high-risk drug users. Among users in south west Sydney, smoking was a predominant route of administration, partly due to the cultural stigma associated with injecting.

A World Health Organisation regional conference in Perth presented a series of research papers on harm minimisation in the Asia Pacific area (Hawks, 1996). These highlighted the socio-cultural contexts of substance use development such as: the breakdown of protective class-associated norms for drug use in India due to urbanisation; and the protective isolation of Fiji but growing economic pressures for the cultivation of cannabis.

Data quality:

- Although limited numbers of studies have been done among Australian C&LD populations, many have integrated both quantitative and qualitative methods to expand the depth of the data.

Current status:

- Ethnographic work which explores the context of drug use and drug-related harms among Indo-Chinese and other ethnic groups, continues in south western Sydney.
- The Macfarlane Burnet Centre for Medical Research continues to work collaboratively with NDARC and community based organisations to develop innovative cultural-based initiatives.

Emerging issues:

- Changing patterns of drug use and availability and their influence on associated harms among injecting drug users of C&LD backgrounds.
- The effects of migration, refugee status and/or return visits to background countries on substance use and associated harms.
- The influence of acculturation issues on illicit drug use for adolescents of C&LD parents.
- The need for a better understanding of social networks, economics and geography of illicit drug use in C&LD populations.

3.2.7 PRISONERS

There has been a 50 percent increase in the Australian prison population over the last decade to a record daily census of 19,000 inmates in 1998. The throughput of inmates per annum is thought to be almost double this figure, but surprisingly, is not recorded. A comprehensive inmate health survey of a random sample of over 800 inmates in NSW (Butler, 1997) found that one third of female inmates and one fifth of male inmates reported injecting while in prison. Most of these (69%) reported sharing syringes with multiple partners. More females (48%) than males (28%) had sought treatment for a drug problem. Over one-third of prisoners have HCV (Butler, Dolan, Ferson *et al.*, 1997). Such patterns of risk taking behaviours were similarly found in a study of inmates of Victorian prisons (Crofts, Thompson, Wale & Hernberger, 1996). Of the 76 deaths occurring in Australian prisons during 1997/98, seven were caused by illicit drug use (Dalton, 1998).

One third of prisoners (33%) in NSW reported being under the influence of a drug at the time of their offence (Kevin, 1992) and 20% reported experiencing withdrawal symptoms on reception to prison (Kevin, 1993). One half of prisoners reported committing an offence to

support their drug habit, while three quarters reported a drug or alcohol problem prior to incarceration (Dolan, Shearer, Hall & Wodak, 1996). The proportion of IDUs being imprisoned in Australia is similar to that in many other western countries (Abeni, Perucci, Dolan & Sangalli, 1998).

Although women constitute a relatively small segment of prison populations, proportionately more women than men in prison have a drug problem (Maher, 1994; Butler, 1997). This is particularly an issue for women from C&LD backgrounds (Maher *et al.*, 1998). A quarter of a representative sample of young offenders in NSW had ever injected, over one-third of whom also reported sharing needles (Hando, Howard & Zibert, 1997).

Data quality:

- The quality of the inmate health survey data is good and there is reasonable consistency across prison studies.

Current status:

- The relationship between social climate and drug use in NSW prisons is currently being studied.

Emerging issues:

- It is becoming more difficult to conduct research in prison. Ethics committees and the privatisation of Victorian prisons have delayed or blocked studies.
- An over-representation of Indigenous Australian and C&LD groups in prison populations.

3.2.8 HOMELESS PERSONS

Few studies have been conducted in this area and the majority of studies in Australia have focused on adolescent rather than adult homelessness. Two recent studies involving adult homeless individuals were in Melbourne (Kermode, Crofts, Miller *et al.*, 1998) and Sydney (Hodder, Teesson & Buhrich, 1998). The Melbourne study reported a much higher prevalence of cannabis use (22% vs. 12%), injecting (28% vs. 1%) and injecting heroin use (22% vs. 1%) compared to the Victorian general population. The authors note that 20-25% had elevated liver function tests, which are associated with hepatitis. The Sydney study provided prevalence of substance abuse and/or dependence rather than use. Thirty-six percent of the sample had some type of drug use disorder compared to 2% of the Australian general population. The majority of problems were dependence on cannabis (21%) or opiates (20%). Comorbidity between substance use and other mental disorders was common. These findings have been similar to those of a recent training needs analysis conducted by DASC and NCETA, where staff of Sobering Up units reported that polydrug use was common, and often co-occurred with mental disorders.

The high level of drug use amongst homeless youth in Australia was highlighted in a 1994 subsample of the NDS household survey, and also in a study examining patterns of drug use, binge drinking and suicide attempts among this group (Sibthorpe, Drinkwater, Gardner & Bammer, 1995). In addition, Spooner and colleagues (Spooner, Mattick & Howard, 1996)

reviewed several other Australian studies prior to 1995 and noted consistent reports of increased substance use, abuse and health problems among this group.

Data quality:

- Kermode *et al.* (1998) note the difficulty in sampling homeless populations due to a lack of adequate characterisation of the target population. They attempt to overcome this by employing a probability sample of accommodation sites and a convenience sample from street and squat residents.
- Most adolescent studies are based on convenience samples from schools, shelters and drop-in centres. Probability samples are rare.
- Most studies employ quantitative survey designs, with limited qualitative or ethnographic comparative work.

Current status:

- No current studies.

Emerging issues:

- Better data are needed on patterns of drug use and associated harms among homeless youth.
- There are indications of increased access to street drugs by mentally ill people in the community and persons seeking accommodation at services.
- Interactions between street drugs and medications used to manage mental health problems.

3.2.9 GAY COMMUNITIES

Ireland *et al.* (in prep.) summarise Australian and overseas research on drug use among gay men which indicates that illicit drug use and injecting drug use are consistently higher for gay men than the general population. Within Australia, a national survey of gay men, entitled "Project Male Call", found that 53% had used illicit drugs, compared to 35% of males under 40 from the general population. Figures for injecting were 4.4% vs. 0.6%, respectively. Higher levels were noted among HIV positive men and younger males, which is consistent with previous studies. Regional cohort surveys (Prestage, Knox, Kippax *et al.*, 1997) reported even higher prevalence of illicit drug use and injecting among samples of gay men from Sydney (78%, 12%), Melbourne (70%, 6%) and Brisbane (71%, 16%).

Ireland *et al.* note associations between increased substance use and lifestyle stressors, such as discrimination, homophobia and HIV. The higher prevalence of substance use among HIV positive gay men has been suggested as possibly therapeutic for stress or health conditions (Guinan, Hall, Clark & Gold, 1992; Prestage, Culpin, Van de Ven *et al.*, 1996) but little research has been reported on reasons for use in this population. Ireland *et al.* have found that substance use is often associated with gay identity and "coming out" for young gay men.

Much of the literature on gay drug use has focused on gay male identified communities. Information about non-gay identifying men who have sex with men, lesbians and gay ethnic populations is scarce. Project Male Call reported a lower prevalence of substance use and injecting among men who were "non-gay-community-attached." International studies (Skinner, 1994; Friedman and Downey, 1994) have noted a higher prevalence of both alcohol and illicit drug use among lesbians than heterosexual women. A recent study of women attached to the gay and lesbian community in Sydney (Richter, Lubowitz, Bergin *et al.*, 1997) indicated a higher prevalence of injecting among lesbians (10%) and bisexual women (22%) and a higher proportion of syringe sharing among the injectors. There is limited research on patterns of injecting and drug use among lesbian women.

Data quality:

- Ireland *et al.* (in prep.) summarise some of the methodological problems with the research conducted to date, which include: biased sampling from bars or treatment centres; conflation of drug classes and sexual behaviours; exclusion of participants with inconsistent behaviours; and stigmatisation acting as a barrier to disclosure.
- Data (both qualitative and quantitative) on non-gay-identified or non-gay-community attached samples is limited because of problems recruiting from these populations.

Current status:

- Cohort studies from the National Centre for HIV Social Research continue to collect annual substance use and HIV risk behaviour data among gay men.
- A large scale ethnographic study of gay men's drug use, entitled "Drug Use and Gay Men" will be released early next year. This is an initiative of the National Centre for HIV Social Research, and includes information on drug use and related harms among those who participate in the gay club scene.

Emerging issues:

- Recreational drug use among HIV positive gay men and its influence on anti-HIV therapies.
- Patterns of drug use and injecting among lesbian and bisexual women.
- The relationship between substance use and suicide in young gay populations.
- Initiation and patterns of injecting drug use among gay communities, including the role of drug use in establishing a gay identity among younger gay populations.
- Gay men and sexual risk behaviour.
- Co-infection and drug use.

3.2.10 CLINICAL POPULATIONS

A national census of clients presenting to specialist drug treatment services in Australia (excluding methadone clients) was undertaken in 1990, 1992 and 1995 (Webster, Mattick & Baillie, 1992; Chen, Mattick & Baillie, 1993; Torres, Mattick, Chen & Baillie, 1996). These censuses included any agency that specialised in the care, treatment or rehabilitation of persons requiring assistance because of problems caused or exacerbated by the use of

substances, including alcohol. The latest survey found that most clients were seen in NSW (42%), followed by Victoria (18%) and Queensland (17%) (Torres *et al.*, 1996).

Most clients (92%) were substance users presenting with a drug problem, the remainder being friends/relatives of a substance user. Among the substance users (n=4,775), the mean age was 34 years, over two-thirds (71%) were male, the majority (74%) were Australian-born non-indigenous, 12% were Indigenous Australian, and 13% were born overseas. The majority (94%) spoke English at home. Eighteen percent were in paid employment (full or part-time), while 43% were unemployed. Outpatient or non-residential services were more prevalent than residential services (n=3,008 and n=2,342, respectively). Alcohol was the drug most frequently reported as problematic (49%), followed by opiates (34%), and polydrug use including opiates (12%), cannabis (7%) and amphetamines (6.5%). Over a third (38%) had injected drugs in the 12 months preceding census day.

Between 1992 and 1995, there was a slight decrease in the average age of substance users (from 34.7 to 33.8) and there were increases in the proportion of substance users who were: Indigenous Australian (8.8% to 11.8%), unemployed (34% to 42%), had received outpatient services (51% to 53.5%), reported a primary cannabis (4.1% to 6.7%) and amphetamine (3.9% to 6.5%) problem and had injected drugs (33.5% to 38.2%).

The Commonwealth Department of Health and Family Services reported that there were 16,906 clients enrolled in a methadone program as at 31 March 1995 (cited in Torres *et al.*, 1996). The majority of these clients (61%) were being treated in the private sector, 34% were being treated in the public sector, 4% were in a prison program and 2% were hospital based. Over half (55%) resided in NSW.

Data quality:

- The national census of clients of treatment service agencies is a series of high quality surveys which is conducted every 2-3 years to allow trends to be monitored in client characteristics, drug use and treatment seeking. They do not include data from clients attending only methadone programs, self-help groups, sobering-up centres, or services that provide only information, education, accommodation, brief counselling, telephone counselling and crisis interventions. They reported a response rate of 92% in 1995. The authors of these reports note a number of limitations with this data, such as: exclusion of clients of non-residential services who were not seen on census day; under-representation of clients with a primary tobacco problem; and a third of agencies (38%) reporting that the clients seen on census day were not typical of their client load.

Current status:

- There are no plans to repeat the national census of clients presenting to drug treatment agencies.
- A national minimum dataset is being developed that will allow trends in client populations to be more closely monitored (Conroy & Copeland, 1998).

Emerging issues:

- Further research is required to explore changes in the characteristics of treatment seeking populations (eg. Indigenous Australians, youth, injecting drug users).
- Tracking individuals and services to determine service utilisation.

3.3 MONITORING SYSTEMS

The Illicit Drug Reporting System (IDRS) is a national system that monitors trends in illicit drug use, availability and harms that has been developed and tested over several years (Hando, O'Brien, Darke *et al.*, 1997; Hando, Darke, O'Brien *et al.*, 1998). The IDRS collects original and existing data annually on the use of four illicit drugs (heroin, cocaine, amphetamines and cannabis). Its three main components include: a survey of injecting drug users, a survey of key informants who have extensive exposure to drug users, and the collection of other indicators from police, health and research sources. It is expected that such data will assist decision making about future directions in drug policy.

The IDRS is similar to the Community Epidemiology Work Groups that are conducted in the U.S.. There are a number of other monitoring systems in the U.S., such as, the Drug Abuse Warning Network (DAWN) which collects data on the incidence of emergency room episodes, Pulse Check reports which summarise key informant information, and the Drug Use Forecasting Program (DUFPP) which collects urinalysis data on drug use among arrestees.

In Australia, other regular sources of information on illicit drugs come from annual reports produced by the Australian Bureau of Criminal Intelligence, which summarise law enforcement statistics, and 2-3 yearly surveys of the general population, secondary school students, and drug treatment clients.

Data quality:

- The IDRS: provides information on injecting drug users who represent a sentinel group of illicit drug users; recruits well informed key informants in a systematic fashion; avoids an over-reliance on law enforcement and clinical indicators; and combines brief, timely and comparable data from a number of sources (Hando, Darke, O'Brien *et al.*, 1998). Limitations include the collection of original data using a non-probability sampling frame, and a focus on the more hazardous forms of drug use such as injecting drug use, rather than recreational drug use.
- The IDRS is supplemented by regular data from other key sources, including household and school surveys which apply random sampling frames.

Current status:

- A system based on the Drug Use Forecasting Program in the U.S. which analyses urine samples from arrestees will soon be trialed in three Australian cities (DUMA), managed by the Australian Institute of Criminology.
- The IDRS continues to be refined and evaluated while being implemented in three

Australian States (NSW, SA, Victoria), with a modified version to be implemented in the remaining States in 1999.

- The National Crime Statistics Unit is developing a report on drug-related crime.
- The Australian Federal Police is proposing to monitor the impact of offshore drug seizures on Australian drug markets.
- A Youth Illicit Drug Surveillance System is being developed at the NSW Drug and Alcohol Directorate.

Emerging issues:

- More work is needed to integrate health and law enforcement data sets on illicit drug use in Australia to ensure their consistency.
- The feasibility and interpretation of early warning indicators and their links to policy and planning requires further examination.
- The application of information technology for monitoring purposes is an emerging area of interest e.g. examining geographic information systems.
- Random urine sampling among IDUs in treatment would provide a means of monitoring illicit drug use; they are currently not randomly collected.
- There is a need to improve the quality and scope of data sets relating to deaths, ambulance attendance and hospital emergency department and inpatient admissions.
- Monitoring special populations, such as rural IDUs, is required.

4.0 ANTECEDENTS AND RISK FACTORS FOR ILLICIT DRUG USE

There is a vast literature on the correlates of initiation to drug use, continuation of drug use and development of problematic drug use (IOM, 1996; Spooner, Mattick & Howard, 1996; Hawkins, Catalano & Miller, 1992; Robinson and Berridge, 1993; Altman, Everitt, Glautier *et al.*, 1996; Blum, Cull, Braverman & Comings, 1996). Most of the research has been conducted in the U.S., although there is increasing interest in this area among Australian researchers.

The literature identifies a range of risk and protective factors that may be modified to reduce drug use and drug-related harm (IOM, 1996). The focus of much of the research has been on risk factors among adolescent populations and for alcohol use. There is less emphasis on protective factors, or factors associated with illicit drug use, although cannabis receives some attention (eg. see Donnelly & Hall, 1994 for a review). It should be noted that the antecedents of initial drug use are not necessarily those that lead to chronic drug abuse. Paglia & Room (1998) cite research in which experimentation and infrequent substance use is more a function of peers and social factors while problem drug use may be more associated with biological and psychological factors. Note also that some risk factors may also be consequences of drug abuse, and are reviewed in later sections.

While most of this research draws upon quantitative research findings, ethnographic research in Australia provides useful descriptive information about drug use that would otherwise be difficult to obtain (Spooner *et al.*, 1996). Key examples are Moore's (1993) study of psychostimulant users in Perth, Maher and colleagues' (1998) study of young initiates to heroin use in south west Sydney, Fitzgerald & Hamilton's study of hallucinogen use in

Melbourne (Fitzgerald & Hamilton, 1995), and Dance's (1991) research with illicit drug users in Canberra.

Other information on why people use substances can be obtained by directly asking drug users, who often provide very different perspectives on the issue (Spooner *et al.*, 1996). Illicit drug users themselves usually have functional self-reported reasons for starting and continuing drug use, which vary according to the type of substance used. For example, drugs may initially be used as a result of curiosity or peer pressure. Continued stimulant use is said to occur for recreational and social reasons (eg. to party and have fun), whereas opiates, sedatives, inhalants and to some extent cannabis, are said to be used to prevent boredom and worries (Spooner *et al.*, 1996), although there may be considerable interchange between drug types. Self-reported information on reasons for drug use is usually collected in surveys of illicit drug users in Australia. In addition, two studies conducted in the early 1990s in Sydney specifically examined functional drug use (Stowe & Ross, 1992; Sharp, Davis, Dowsett *et al.*, 1991).

4.1 BIOLOGICAL FACTORS

Biological factors include genetic or physiological conditions that are associated with a greater risk of drug problems and physiological response mechanisms, which contribute to addictive behaviours. These biological factors can increase vulnerability to drug use problems in combination with the psychosocial and contextual factors discussed below.

The bulk of the research on genetic factors has focused on alcohol dependence, with more recent studies looking at illicit drug addiction and smoking (Hawkins *et al.*, 1992; Altman *et al.*, 1996; Blum *et al.*, 1996; IOM, 1996). Family studies have identified increased risks of alcohol dependence and drug abuse in children of alcoholics, but often fail to distinguish between hereditary and environmental factors. Studies of twins indicate a higher probability of concordant dependence on alcohol, nicotine and caffeine among identical than non-identical twins. They also indicate that males have higher probabilities than females although a recent study has suggested females have a similar probability (Heath, Bucholz, Madden *et al.*, 1997). The predisposition to drug abuse has also been shown when twins are raised separately.

In an attempt to correct for environmental factors, adoption studies of the children of alcoholics raised by non-alcoholic parents consistently show that these children are more likely to develop drug problems than those with non-alcoholic parents. The important factor, which the literature still does not consistently demonstrate, is the identification of the genes associated with drug problems. Blum and colleagues (1996) have noted that genes that develop the dopamine receptors are most commonly associated with alcoholism, but also with the compulsive use of nicotine and cocaine.

There are variations in the way the body metabolises alcohol and drugs that may protect some populations from drug abuse. Asian populations often have variations of liver enzymes which metabolise alcohol that allow chemicals produced by alcohol consumption to accumulate in the blood producing an adverse reaction. This protective mechanism prevents Asian individuals from consuming large amounts of alcohol. Blum and colleagues (1996) note the final neurological reactions to most drugs of abuse involved dopamine release in the brain.

They suggest that the genetic variations in risks of dependence on various drugs and compulsive behaviours may be due to genetic abnormalities in dopamine receptors.

Current status:

- Very little biological research has been conducted in Australia, with the exception of twin studies of biological markers of alcohol use and studies of the prevalence of the dopamine D-2 receptor in persons with alcohol dependence.
- Australia has supported extensive research on the behaviour genetics of alcohol use and dependence using the NH&MRC twin registry (eg. Heath & Martin, 1994; Heath, Slutske, Bucholz *et al.*, 1997). Data has also been collected on other drug types. Further analyses will examine genetic factors involved in cannabis use. Most of the funding for this research has been derived from the National Institute of Health in the U.S.

Emerging issues:

- Large scale genome scan for correlates of psychiatric disorders in data collected from Australian twin registry, including use of marijuana and other illicit.
- Differential gene expression following acute and chronic exposure to drugs and alcohol.
- Development of novel pharmacotherapies for the treatment of drug and alcohol craving.
- The neurogenetic basis of vulnerability to addiction.
- Animal models of the various stages of drug use and dependence (initiation, maintenance, loss of control, withdrawal, relapse, overdose, dependence) for all illicit drug classes.
- Long term neural and behavioural consequences of MDMA use.

4.2 PSYCHOSOCIAL FACTORS

Psychosocial factors include individual factors that contribute to psychological vulnerability for drug use and abuse. Research on the association between adolescent personality characteristics and illicit drug use shows that the most powerful predictors of more frequent drug use include rebelliousness, tolerance of deviance, and low school achievement (IOM, 1996). Similar antecedent personality attributes reflecting lower levels of conventionality and more positive attitudes toward drug use predict the initiation of smoking, drinking and drug use (IOM, 1996). Spooner *et al.* (1996) note that such variables reflect alienation from society, and can represent a significant barrier to adolescents addressing substance abuse. Programs that facilitate societal bonding and psychosocial conventionality can improve health-enhancing behaviours (Spooner *et al.*, 1996).

While there is a tendency for adolescents who have drug problems to have higher rates of emotional or psychiatric problems than other adolescents, research does not clearly identify mental health problems as a significant risk factor for substance abuse (Spooner *et al.*, 1996). Furthermore, various relationships have been proposed between substance abuse and psychiatric disorders, such as substance use inducing psychiatric problems in susceptible individuals, or substance use acting as a form of self-medication (Spooner *et al.*, 1996).

Longitudinal studies have found that emotional distress in childhood contributes to frequent drug use later in life. Aggressive behaviours in boys, conduct disorder, hyperactivity and attention-deficit disorders have also been found to precede the onset of drug use (Hawkins *et*

al., 1992). In some cases, these disorders have occurred conjointly with drug abuse (IOM, 1996).

Data validity:

- The majority of studies in this area have examined risk factors for initiation of adolescent drug use, rather than problematic use. Most are limited in that they use cross-sectional survey designs, fail to control for other potentially important risk factors (eg. psychiatric disorders, familial drug abuse) and do not distinguish between drug use and abuse (IOM, 1996).

Current status:

- Longitudinal studies of adolescent mental health and drug use are being conducted at the Centre for Adolescent Health (Melbourne University).
- The Centre for Adolescent Health is also examining the contribution of early childhood factors (such as temperament and behaviour) to adolescent drug use.

Emerging issues:

- Applicability of U.S. findings to Australia.
- Individual difference factors such as sensation seeking and depressive symptoms.
- Emotional and social competency factors that enhance resilience for risk factors, and how these translate into interventions for schools and parenting.

4.3 CONTEXTUAL FACTORS

Contextual factors include factors external to the individual which arise in the social or broader environment (IOM, 1996). A number of family factors may increase the risk of the development of drug use and abuse, including poor quality of the child-parent relationship, family disruption, poor parenting, parent and/or sibling drug use, child abuse, parental attitudes sympathetic to drug use, and social deprivation (IOM, 1996; Hawkins *et al.*, 1992). The reverse of these factors can be seen as protective, whereby family attachment can serve as a deterrent to substance use (Spooner *et al.*, 1996). Family influences are complex and can vary with the age of the child (Spooner *et al.*, 1996).

The peer environment also makes a substantial contribution to variations in drug use and abuse (IOM, 1996), particularly with cannabis or multiple substance use (Spooner *et al.*, 1996). Peer impact is influenced by other factors, particularly those factors that relate to the choice of peer groups such as family influences and social skills (Spooner *et al.*, 1996).

Low commitment to education and poor school performance have been associated with substance misuse and delinquent behaviour, which may be influenced by the timing of academic problems (Spooner *et al.*, 1996; Hawkins *et al.*, 1992). However, academic problems might be a contributor or a consequence of substance abuse (Spooner *et al.*, 1996).

The literature presents conflicting evidence on the relationship between substance abuse and socio-economic status (SES), which may partly be due to a lack of knowledge of SES

characteristics among adolescents participating in research. Spooner *et al's* (1996) review concludes that SES does influence substance use behaviours among adolescents, and Hawkins *et al.* (1992) note that this is particularly the case when poverty is extreme and occurs in conjunction with childhood behaviour problems.

Early onset of drug use has been found to predict an increased risk of drug problems (Hawkins *et al.*, 1992; Spooner *et al.*, 1996). In Australia, secondary analyses of the ANAIDUS, ASHIDU and national household survey data found that there has been a decrease in the age of initiation to heroin use, with a younger age of initiation associated with greater polydrug use, overdose and crime (Lynskey & Hall, 1998).

The literature also identifies a number of macro-environmental risk factors (eg. advertising, legislation, law enforcement, the availability of substances, social norms) for drug use, most of which have received little research attention. Exceptions in Australia are the cannabis expiation notice scheme (see section 6.1.3) and growing research on the impact of law enforcement on the illicit drug market (eg. Sutton & James, 1996; Maher & Dixon, in press; Weatherburn & Lind, 1997; Maher, Dixon, Swift & Nguyen, 1997).

Data quality:

- The available data is still not able to accurately predict who will become a substance abuser (Spoonner *et al.*, 1996).
- Reviews of the data often rely upon quantitative findings, with little emphasis on important ethnographic research conducted in the area.

Current status:

- The Centre for Adolescent Health is examining parenting of adolescents and the implications of this for interventions.
- The 1998 NDS household survey has collected peer and familial data which will be analysed.
- The University of Melbourne and NCRPDA are evaluating the National Community Based Approaches to Drug Law Enforcement.

Emerging issues:

- Studies have not yet examined the influence of peers in the transition from drug use to abuse, or the contributing effects of peer influences at different stages of development (IOM, 1996).
- Many studies have not demonstrated the specificity of familial effects because they do not include comparison groups of parents with other chronic disorders (IOM, 1996).
- Examination of protective factors and factors important in the transition from drug use to abuse and dependence (IOM, 1996).
- Ethnographic exploration of contexts of drug use.
- Interaction of illicit drug use and child abuse.
- Influence of media, fashions and fads on drug use.
- How law enforcement impacts on harms and the illicit drug market.

- How to shape markets that produce the least adverse health effects.
- Multidisciplinary studies on the variables associated with drug abuse (biological, contextual and social) (IOM, 1996; Altman *et al.*, 1996).

5.0 DRUG-RELATED HARMS

5.1 MORTALITY AND MORBIDITY

The Commonwealth Department of Health (Drugs of Dependence Branch) has commissioned two studies during the previous ten years that have examined the contributions of drug use to premature mortality and morbidity in Australia. The second study (English, Holman, Milne *et al.*, 1995) substantially improved upon the methods of the first (Holman *et al.*, 1990, cited in Hall, 1996). It included an important approximate account of harm to health caused by drug use as assessed by premature mortality, life years lost and treated morbidity (as reflected in hospital episodes and hospital bed days).

Overall, tobacco followed by alcohol were shown to have a greater adverse impact on health, compared to illicit drugs. During 1992, there were 488 illicit drug-related deaths in Australia, 17,899 illicit drug-related life years lost (mean 36.7 years per death), and 40,522 illicit drug-related bed days. There was an overrepresentation of males in all age groups for mortality, reflecting the higher prevalence of illicit drug use and dependence among males. Deaths were also concentrated among the younger age groups, especially in the 20s and 30s. Illicit drug use accounted for a smaller aggregate number of life years lost than other drugs, but a larger number of life years per death, reflecting the young age at which illicit drug users die (median 30 years). Hospital morbidity attributable to illicit drug use was also concentrated in the young age groups, with the addition of morbidity attributable to the effects on babies and infants of maternal illicit drug use. The major cause of illicit drug-related deaths was opiate "overdose". Deaths related to infectious diseases among injecting drug users (eg. HIV, HCV) were not reflected to a large extent in this data, although this may change in the future.

Three national one day censuses of clients of specialist drug treatment agencies conducted in 1990, 1992 and 1995 (Torres, Mattick, Chen & Baillie, 1996) found that opiates were the main problem drug in a third of clients. There were significant increases in the percentages presenting with primary amphetamine and cannabis problems (both from 4% to 7%). There is no systematic, national collection of these statistics in Australia, although there are plans to develop a minimum data set.

The first National Survey of Mental Health and Well-Being (NSMHWB), conducted during 1997 with a sample of 10,641 Australian adults aged 18 years and over, provides nationally representative data on the prevalence and correlates of substance use and psychiatric disorders among Australian adults in the past year (Hall, Teesson, Lynskey & Degenhardt, 1998). It found that 2.2% of Australians had a drug disorder (other than alcohol) in the past 12 months. The risk decreased with increasing age, and was higher among males. Cannabis accounted for the most illicit drug use disorders (1.7%). While details on the prevalence of comorbid illicit drug use and other mental disorders are not yet available, the survey found that half (46%) of females and a quarter (25%) of males with an alcohol or drug use disorder met criteria for another mental disorder.

Data quality:

- The most recent Australian study on mortality and morbidity (English *et al.*, 1995) has been carefully conducted, adopts a critical approach to the interpretation of epidemiological data, and shows that its authors have been responsive to criticisms of the earlier study (Hall, 1996). Nevertheless, the quality of evidence available on causal relationships between illicit drug use and health status is not as good as that for tobacco and alcohol, and probably underestimates the contribution of illicit drug use.
- Regular, national censuses of clients in specialist drug treatment services, and the national mental health survey have also been carefully conducted and provide useful profiles of morbidity among client and general populations.

Current status:

- A trial of a national minimum dataset for drug treatment clients in Australia is underway and will provide additional data on trends in drug dependence.
- Further analyses of data from the NSMHWB are being planned by NDARC.
- The AIHW is revising aetiological fractions with an emphasis on illicit drugs and their effects upon mortality and morbidity.
- The latest NDS household survey has collected data on psychiatric status (SF-36) which has not yet been analysed.

Emerging issues:

- The need to improve estimates of drug-related death rates among IDU.

5.2 ADVERSE HEALTH AND PSYCHOLOGICAL EFFECTS

5.2.1 DRUG-SPECIFIC HARMS

5.2.1.1 *Cannabis*

Hall & Solowij (1998) summarised the international literature on the adverse health and psychological effects of cannabis, updating an extensive earlier review of the area (Hall, Solowij & Lemon, 1994). They note acute symptoms which include: anxiety and panic, especially in naive users; impaired attention and memory and psychomotor performance while intoxicated; possibly an increased risk of accident if a person drives a motor vehicle while intoxicated with cannabis, especially if cannabis is used in combination with alcohol; and an increased risk of psychotic symptoms among those who are vulnerable because of personal or family history of psychosis.

The most probable chronic effects include: chronic bronchitis and histopathological changes that may be precursors to the development of malignancy caused by smoking cannabis; a cannabis dependence syndrome characterised by an inability to abstain from or to control

cannabis use; and subtle impairments of attention and memory that persist while the user remains chronologically intoxicated, and that may or may not be reversible after prolonged abstinence.

Possible adverse effects that remain to be confirmed include: an increased risk of cancers of the oral cavity, pharynx and oesophagus; an increased risk of leukemia among offspring exposed while in utero; and impaired educational attainment in adolescents and underachievement in adults in occupations requiring high level cognitive skills.

Groups at higher risk of experiencing these adverse effects include: (1) adolescents with a history of poor school performance, who initiate cannabis use in the early teens, are at increased risk of using other illicit drugs and of becoming dependent on cannabis; (2) women who continue to smoke cannabis during pregnancy may increase their risk of having a low birth weight baby; (3) persons with asthma, bronchitis, emphysema, schizophrenia, and alcohol and other drug dependence, whose illnesses may be exacerbated by cannabis use.

Hall (1995) notes that in Australia, the most significant public health risks of cannabis use are likely to be the acute effects, since these may be experienced by the larger numbers of cannabis users who use the drug on a small number of occasions before discontinuing. Acute effects of most concern include a higher risk of adverse psychological experiences and probably a higher risk of motor vehicle accidents. The major public health risks of regular cannabis use are, in probable order of magnitude: dependence, respiratory disease, precipitation or exacerbation of psychoses, low-birthweight babies and cognitive impairment.

A number of recent Australian surveys have examined the issue of cannabis dependence and other health effects among long-term users in rural and urban locations (Swift, Hall & Copeland, 1997; Swift, Hall & Copeland, 1998; Swift, Hall, Didcott & Reilly, 1998). They have found that symptoms of cannabis dependence are common, especially among urban (Sydney) users. More severe dependence symptoms were noted among younger users and those using greater quantities of cannabis. Other statistics show a significant increase in those presenting to treatment services with a primary cannabis problem in Australia during the 1990s (Torres *et al.*, 1996). Cannabis accounted for most drug use disorders (excluding alcohol) in the National Survey of Mental Health and Well-Being (Hall *et al.*, 1998).

Laboratory studies (involving humans) on the cognitive effects of chronic cannabis use have also been conducted (Solowij, 1998).

Data quality:

- Hall (1995) notes that it is difficult to make causal inferences about the connections between cannabis use and the adverse health and psychological consequences, especially the long-term effects. While the most rigorous evidence comes from laboratory studies involving animals, the relevance of such research to human disease is problematic. Epidemiological studies present more relevant evidence but are affected by difficulties in assessing exposure to cannabis and in excluding alternative explanations of associations.

Current status:

- More detailed analyses of cannabis use disorders in the NSMHWB will be undertaken by

NDARC staff.

- These will be complemented by analyses of data from the 1998 NDS Household Survey.
- Research has been funded by the Victorian government on cannabis use and psychosis.
- Research is currently being done in Victoria on the effects of cannabis upon driving.

Emerging issues:

- Possibly an increase in cannabis use disorders and other cannabis-related harms, especially among young adults.
- Aetiology of cannabis dependence.
- Case control studies of throat and upper respiratory cancers in chronic cannabis smokers.
- Cannabis-related psychosis.
- Lack of research on cannabis treatment programs for adolescents.
- Impairment of driving performance.
- Relationship between cannabis use and criminal offending among juveniles

5.2.1.2 *Opioids*

Research has examined issues of opioid-related overdose, psychopathology, polydrug use and polydrug dependence. The adverse effects of unsafe injection practices (such as HIV and infectious disease) are discussed in section 5.2.2.

Darke & Zador (1996) note that in many countries deaths attributed to overdose remain the most common cause of mortality among heroin users. In recent years there has been an increased focus on opioid-related overdose that is particularly relevant in Australia where rates of HIV infection among IDU remain low. Australian research has examined the circumstances and correlates of non-fatal opioid overdoses (eg. Bammer & Sengoz, 1994; Bammer, Ostini & Sengoz, 1995; Darke, Ross & Hall, 1996a; McGregor, Darke, Ali & Christie, 1998; Loxley & Davidson, 1998; Darke, Sunjic, Zador & Prolov, 1996) and fatal opioid overdoses (Zador, Sunjic & Darke, 1996; Darke & Ross, in press; Hall & Darke, 1998; Lynskey & Hall, 1998). Australia has also hosted both national and international symposia on the topic of opioid-related overdoses (Lenton, Stockwell & Ali, 1997; Hall, 1998).

Research has found that males were typically over-represented in overdose fatalities, as were older, opioid dependent persons, and those not in treatment. Only a minority of fatalities occurred among recreational heroin users, and among heroin smokers rather than injectors. Other evidence suggests that most deaths occur in the presence of others, who are often reluctant to seek medical assistance, even though deaths are usually not instantaneous. Furthermore, a substantial proportion of heroin overdoses are fatalities due to multiple drug use (particularly CNS depressants), with issues of heroin purity of less importance. There has been an increasing number of deaths due to opiate use since 1979, along with an increased average age at death. The experience of non-fatal overdose among heroin injectors in Australia is widespread (up to 68%). Darke & Zador's (1996) review of the international literature on fatal heroin overdose notes a number of consistent features between countries.

There has also been some recent investigation into the occurrence of deaths associated with methadone (Zador, Sunjic & Basili, 1998; Sunjic & Zador, 1997; Williamson, Foreman, White & Anderson, 1997). Research on deaths among clients in the NSW methadone program found no increase in the rate of deaths, and that most deaths were polydrug cases. Approximately half of all methadone deaths occurred among drug users not enrolled in methadone treatment, highlighting the issue of the diversion of takeaway methadone doses to the black market. Further information about this practice and its associated harms comes from a survey conducted by Darke, Ross & Hall (1996b) of heroin injectors in Sydney, about half of whom had injected methadone syrup. Methadone injection was correlated with substantial levels of physical and psychological morbidity. Takeaway doses were found to provide the largest source of methadone for injecting.

Several studies have examined psychopathology among heroin injectors. Darke (1998) reviewed the international literature on antisocial personality disorder (ASPD) among heroin users which produced estimates ranging between 35% and 61%, compared to 4% in the general population. Studies show that ASPD is associated with earlier onset of drug use and injecting, increased diagnoses of substance abuse and dependence for drugs other than heroin, and increased HIV risk-taking. Recent Australian research has examined distinctions between ASPD and psychopathy among heroin injectors (Darke, Kaye & Finlay-Jones, in press). Other research repeatedly shows the occurrence of high levels of psychological distress among heroin users, particularly mood and anxiety disorders (Darke, 1998).

Darke & Ross (1997) examined the issue of polydrug dependence and comorbidity among heroin injectors. They found high levels of polydrug dependence, lifetime anxiety and depressive disorders, which did not vary by treatment status or gender. Overall, the more psychologically distressed subjects were, the more different types of drugs they were dependent upon. The direction of the causal relationship, however, remains unclear.

Other research on polydrug consumption has examined the use of benzodiazepines among heroin injectors, finding numerous harmful consequences associated with such use, particularly when benzodiazepines were injected (Darke, 1994; Ross, Darke & Hall, 1996, 1997). This includes higher levels of needle sharing, polydrug use, dependence, psychopathology, overdose, crime, as well as poorer health and social functioning. More recent research has noted the increased use of anti-depressants among this group.

No Australian study has examined cognitive deficits among heroin users. This is despite the fact that there are good reasons to suspect an excess of acquired brain damage among heroin users that could result in cognitive disorders affecting memory and behavioural control. Specifically, these relate to hypoxic brain damage in non-fatal overdose, brain damage due to heavy alcohol consumption, and exposure to traumatic head injury from violence. A recent pilot study among Sydney methadone maintenance patients found the prevalence of head injury to be ten times that of the general population (Shane Darke, personal communication, 1998). The possibility of cognitive impairment among heroin users has implications for clinical management. Poor new learning ability will impair the capacity to remember program rules, and reduced adaptive abilities will both limit the capacity to change and cause problems in the self-regulation of behaviour in accordance with program rules and medication regimes.

Finally, there have been some advances in instrument development in the area. The Opiate Treatment Index was developed to assess six key domains among heroin injectors: drug use; HIV risk-taking behaviour; social functioning; criminality; health; and psychological adjustment (Darke, Hall, Wodak *et al.*, 1992). While the instrument was designed for use in clinical settings, it has also been used with community samples of heroin injectors, and has good psychometric properties. However, its application among increasingly prevalent groups of heroin smokers and other types of drug users (eg. stimulant bingers) appears to be limited. It also fails to measure important injection-related risk taking behaviours such as sharing paraphernalia, which put IDU at risk of contracting HCV.

Current status:

- There is continued research into opioid-related overdose in several Australian States.
- The NSW Health Department has convened a specialist overdose committee that meets on a regular basis to discuss overdose issues.
- A system for monitoring non-fatal overdoses attended by the Melbourne Ambulance Service is currently being developed by Turning Point.
- A study is in progress in WA into the feasibility of conducting a trial into the provision of naloxone to heroin users for peer administration to prevent overdose.
- A preliminary study examining standardisation of the WA coronial database is being conducted by NCRPDA.
- A study is in progress on the prevalence and correlates of anti-depressant use among injecting drug users in Sydney by NDARC.

Emerging issues:

- Further research is required into patterns of drug use and risk factors prior to death.
- Ambulance and police responses to overdose.
- The distribution and effectiveness of naloxone among overdose victims.
- The utilisation of hospital services by overdose victims.
- Overdose deaths among methadone clients and the occurrence of overdose among recently released prisoners.
- The relationship between the provision of methadone treatment and drug overdose.
- The extent of cognitive disability in persons with a history of non-fatal overdose.
- Standardisation of the coronial database so that fatalities can be monitored more efficiently.
- Methadone diversion and its relationship to overdose and takeaway methadone policies.
- Cognitive deficits among heroin users.
- The contribution of anti-depressants among heroin injectors to fatal overdose.
- Need for brief outcome measures.
- Greater knowledge of the characteristics and consequences of polydrug use among IDU.

5.2.1.3 *Amphetamines*

The use of amphetamines represents a potentially significant public health problem in

Australia, primarily due to the large numbers of people who use the drug (6-8% of general population) (Hando, 1997). While not all of those who use amphetamines will have problems, complications from acute intoxication (e.g. overdose, accidents) may occur among the many irregular or occasional users, and may be compounded by polydrug use (which appears to be the norm among this group).

Australian research shows that regular users, about half of whom are usually injectors, may experience substantial levels of psychological morbidity (eg. depression, anxiety, paranoia), health problems, dependence and social dysfunction which could precipitate help-seeking behaviour (Hando, 1997). Recent research in South Australia confirms that amphetamine users are much more likely to have both physical and mental health problems than the general population (Vincent, Shoobridge, Ask *et al.*, 1998). The likelihood of these effects is increased among the many users who binge on amphetamines for several days, and among the significant minority who use large doses at a time, particularly by injection (Hando, 1997).

Less common although potentially more severe effects of amphetamine include a schizophrenia-like psychosis, which may be caused by a large dose or by chronic use over time. While a minority of amphetamine users report violent crimes that are correlated with amphetamine use, it is difficult to exclude the possibility that those with a history of these types of offences are more likely to become involved in heavy amphetamine and other drug use (Hando and Hall, 1997).

Reports of obstetrical and neonatal complications among amphetamine users are infrequent, although there is some overseas evidence of lower birth weights and shorter gestational age among neonates (Hando, 1997). There is some evidence from animal studies that heavy amphetamine use leads to dopaminergic depletion, an increased number of dopamine receptors, and nerve terminal degeneration in the striatum and retroflexus fascicularis. Australian research into the cognitive effects of amphetamine use shows that amphetamine dependence is associated with impaired memory and attention, poor ability to select and preferentially process relevant stimuli, increased psychosis-proneness and general psychiatric disturbance that was not restricted to symptoms of amphetamine psychosis (McKetin, 1998).

One of the most worrisome features of amphetamine use in Australia is the potential for the spread of blood-borne viruses through unsafe injecting practices. While most amphetamine users have been found to have a reasonably good knowledge of how HIV is spread, and do not engage in any *more* needle sharing or have higher HIV seroprevalence levels than primary heroin users (Hall, Darke, Ross & Wodak, 1993; MacDonald, Wodak, Ali *et al.*, 1997), needle sharing is still evident among minorities of amphetamine injectors. Those who shared needles usually did so with a sexual partner or a close friend, however relationships were often short-lived, and a high potential for the transmission of blood-borne viruses to the non-injecting population was also present, with more than half of the injectors (57%) reporting non-injecting sexual partners (Hando, 1997).

Data quality:

- The best documented of the chronic effects of amphetamine use include the development of a dependence syndrome and amphetamine psychosis. Less well known are the effects

of long-term amphetamine use on neuropsychological functioning, violent behaviour and the reproductive system.

- While neuropsychological deficits among amphetamine users in human studies have been noted, it is difficult to attribute this to amphetamine use *per se* as these studies have usually contained low numbers of heavy amphetamine users, and have not successfully controlled for the effects of polydrug use or premorbid conditions.
- Research in the area of reproductive complications is often confounded by the effects of polydrug use (eg. tobacco and alcohol use), poverty, poor nutritional status, lack of prenatal care and a lack of information on the dose, frequency, route and timing of drug administration.

Current status:

- Researchers from NCRPDA are examining amphetamine use and violent crime.

Emerging issues:

- The spread of blood-borne viruses, coupled with increased risks of dependence, health and psychological morbidity among injectors has implications for interventions.
- Further research on the cognitive effects of amphetamine use is required, including brain imaging techniques to show changes in the brain, how debilitating cognitive effects are for users, whether such effects are reversible following the cessation of amphetamine use, and the contribution of premorbid and concurrent factors.
- Violence and amphetamine psychosis may require more observational and ethnographic studies of heavy chronic users in their natural setting, perhaps supplemented by detailed clinical study of individuals who have experienced these effects.
- A lack of specific interventions that will attract and retain problematic amphetamine users in treatment.

5.2.1.4 Cocaine

There is a large body of mainly U.S. literature on the adverse effects of cocaine use. In Australia, the low prevalence of cocaine use has meant that there has been little need until recently to examine these issues. Two recent studies document increasing harms among cocaine users in Sydney since 1993 (Hando, Flaherty & Rutter, 1997; Malcolm, Armstrong, Miles *et al.*, 1996). Results revealed that while there are very few indicators that intranasal cocaine use has resulted in health problems, more serious harms were noted among those injecting cocaine regularly or bingeing on large amounts of cocaine, a group which appears to have increased in recent years (see section 3.2.3.4). Adverse effects include physical and psychological problems, financial difficulties, violence and legal problems. Additional areas of concern include HIV risk-taking behaviour and polydrug consumption, the latter of which potentially places the user at increased risk of unsafe sex and overdose (see also Darke, Baker, Dixon *et al.*, 1992; Darke, 1992). Research in the U.S. has found strong associations between cocaine injecting and more frequent injections, more frequent needle sharing, increased sexual risk-taking, more frequent use of shooting galleries and a higher HIV seroprevalence (eg. Chaisson, Bacchetti, Osmond *et al.*, 1989).

Data quality:

- The two recent studies of cocaine-related harms in Sydney are limited by small sample sizes and sampling frames confined to the inner city.

Current status:

- There are no current studies of cocaine use, although data on cocaine-related harms is collected in surveys of IDUs.

Emerging issues:

- A larger survey of cocaine injectors is required to determine harms (including the incidence of BBV, psychopathology, physical health problems), intervention needs and barriers to treatment seeking.
- Research into effective interventions (both treatment and prevention) to reduce the harms among at-risk groups of cocaine users is required.

5.2.1.5 *Other illicit drugs*

The acute toxic effects of ecstasy and other stimulants may be exacerbated when they are used in environments such as dance parties where the combination of stimulant use, excessive physical activity, and overheating can be fatal (White, Irvine and Bochner, 1996). Several such cases from the use of other stimulants (ecstasy, PMA) have recently been documented in Australia (White, Bochner and Irvine, 1997). A recent community survey of 329 ecstasy users in three States found substantial levels of physical and psychological morbidity, as well as financial, social and occupational problems (Topp, Hando, Degenhardt *et al.*, 1998). Young, female polydrug users and ecstasy bingers were at greatest risk of experiencing problems. One-fifth had received treatment for an ecstasy-related problem, and one quarter wanted to reduce their ecstasy use. Formal treatment was requested by 15% of the sample, and information by 85%.

Studies of anabolic-androgenic steroid (AAS) users note significant health and psychological effects (eg. Peters, Copeland, Dillon & Beel, 1997; Maycock & Beel, 1997). Small proportions of users also report problems with dependence and withdrawal. Potentially harmful activities reported by AAS users included: self-taught injection procedures, injecting specified muscles for localised growth, concurrent use of AAS and use of high doses, use of other drugs such as insulin and human growth hormone, and concurrent recreational drug use especially among gay populations.

Current status:

- Information materials on ecstasy-related harms commissioned by the Federal government have been disseminated in three States, but have not been evaluated (see also section 6.1.4).

- A harm reduction guide for ecstasy users is currently being developed by NDARC.
- A harm reduction pamphlet for AAS users has also been developed by NDARC.
- South Australia has been engaged in a strategic planning process to examine future directions in policies towards AAS use.

Emerging issues:

- The need for treatment and information about harms among ecstasy users.
- Research into steroid dependence syndrome.

5.2.2 NON-DRUG SPECIFIC HARMS

5.2.2.1 *Blood-borne viruses*

Australia has averted an epidemic of HIV infection among IDUs (Feachem, 1995), with HIV prevalence remaining below five percent. In 1997, there were only 23 new cases of HIV infection among heterosexual IDUs diagnosed in the country (NCHECR, 1998). In 1991, an estimated 3,000 cases of HIV infection were avoided through the operation of NSEPs (Feachem, 1995). Recent evidence from overseas indicates that an outbreak of HIV infection among IDUs can still occur even where syringe availability is good, as was the case in Vancouver (Strathdee, Patrick, Currie *et al.*, 1997). Here, social determinants, particularly a history of sexual abuse, were among the most significant predictors of needle borrowing. Other factors that contributed to borrowing used needles included injecting more than four times per day and polydrug use, especially the injection of drug combinations.

In the 1997 NSEP survey, the prevalence of HIV infection was 1.6% and mostly confined to homosexual males. HCV prevalence was 50% overall, but only 22% among those aged less than 25 years. Predictors of HCV infection were; being over 25 years, having injected drugs for more than two years, and imprisonment in the previous year (MacDonald, 1997).

ANCARD's Hepatitis C Sub-Committee estimated the size of the hepatitis C epidemic in Australia (ANCARD, 1998). Of the 110,000 cases of HCV reported, about 80% have been attributed to drug injecting. Current estimations indicate that about 190,000 people are infected with HCV (range 140,000 to 240,000). Among IDUs, HCV prevalence has been between 50% and 70% since the early 1970s. HCV incidence is estimated at around 15% per year or 11,000 new infections. Among IDUs, the incidence of HCV in prison (38%) is thought to be double that in the community (15%) (Crofts, Stewart, Hearne *et al.*, 1995; see also Crofts, Jolley, Kaldor *et al.*, 1997). Projections indicate that the number of people living with HCV-related cirrhosis will more than double by 2010.

Hepatitis B infection receives scant attention although there is a vaccine for this infection. Between 30% and 60% of IDUs have antibodies to HBV while about five percent are currently infectious (Kaldor, Plant, Thompson *et al.*, 1996).

The Victorian Injecting Drug Users Cohort Study (VICS) is the only longitudinal field study of injecting drug use carried out in Australia. It has provided estimates of the incidence of blood borne diseases of HIV, HCV and HBV among IDUs (Crofts & Aitken, 1997). Another

study of the incidence of blood-borne viruses has been conducted by Van Beek et al. (1998). See also Loxley, Phillips, Carruthers & Bevan (1997).

A review of all studies of injecting drug users (up to 1994) found that the level of syringe sharing has decreased from 90 percent to 15 percent over the last decade (Crofts, Webb-Pullman & Dolan, 1996). Since then the level of sharing has remained at around 15% (MacDonald, 1997).

Regular heroin and amphetamine injectors report similar levels of needle sharing and HIV seroprevalence (Hall *et al.*, 1993; MacDonald *et al.*, 1997), although the use of cocaine, benzodiazepines and polydrug use have been associated with both HIV seropositivity and higher levels of risk-taking behaviour (Darke, 1992). A survey by Maher et al. (1998) of primary heroin IDUs in south west Sydney found pockets of higher levels of needle sharing associated with specific features of the local environment, especially the emergence of street based injecting cultures.

It appears possible for drug users to decontaminate HIV but not HCV from injecting equipment. Users are understandably confused about the various cleaning messages that have been promoted (McGeorge, Crofts and Burrows, 1995; Druce & Birch, no date).

IDUs are at risk of contracting HIV from their sexual partner as well as from parenteral drug use. Condom use among IDUs has repeatedly been found to be low (Darke, 1992). This is particularly so with regular partners who are often regarded as being safe. More recent evidence suggests increases in condom use (MacDonald, 1997). For example, MacDonald (1997) found that two thirds of respondents reported recent sexual activity and about half of these used condoms with new sex partners. Research shows that correlates of risky sexual behaviour are different for males and females (eg. Loxley, Bevan & Carruthers, 1998). Studies also show that women are at increased risk of sharing injecting equipment with their sexual partners, and are at increased risk of contracting blood-borne viruses through their greater involvement in the sex industry (cited in Copeland, 1995).

Data quality:

- The evaluation of the Second National HIV/AIDS Strategy provided good quality data on the prevalence and incidence of HIV.
- Most data on HCV relates to prevalence and is of reasonable quality. A small amount of data exist on the incidence of HCV. Virtually no data exist on the effectiveness of interventions to prevent HCV transmission among IDUs (here or abroad).

Current status:

- NCHECR continues to monitor HIV and HCV among IDUs.
- The Commonwealth and the NSW Health Departments are currently devising hepatitis C Action Plans.
- NH & MRC has recently funded a study to carry out a cohort of HCV seronegative IDUs in 3 sites in NSW to identify factors involved in the acquisition and transmission of HCV, seroconversion rates, and related risks.
- NCRPDA is conducting doctoral research examining the risk of HCV transmission to novice IDUs. It has also initiated a five year program into HCV and injecting drug use

funded by the NDS.

Emerging issues:

- Whether or not the hepatitis C epidemic can be brought under control needs investigating. In the short term, this may be best achieved by mathematical modelling.
- Methods to decontaminate HCV from injecting equipment need to be studied.
- The present HCV surveillance system does not adequately assess the participation of injecting users in HCV risk behaviours.
- Understanding the circumstances and predictors of modes of transmission. The role of sharing injecting paraphernalia in the transmission of HCV remains unclear, as does transmission through other methods.
- Hepatitis B vaccination programs for IDUs and especially among imprisoned IDUs should be implemented.
- The extent of HCV transmission in prisons requires study.
- The impact of economic and social policies on transmission and risk behaviour requires assessment.
- More work is needed to monitor rural IDUs and IDUs not in contact with treatment agencies.
- Treatment for HCV infected persons.
- Secondary prevention of harm among IDUs infected with HCV.
- The funding of long term cohort studies of IDU is necessary to gain a better understanding of injecting drug use and related harms.
- Co-infection and drug use.

5.2.2.2 *Other injection-related harms*

Injecting a drug, regardless of the type, places one at risk of abscesses, thrombophlebitis, endocarditis and septicaemia. Cross-sectional surveys of injecting drug users have examined the prevalence of injection-related health problems and found high levels of vascular problems, such as abscesses/infections, scarring and bruising, and difficulty injecting (eg. Darke, Hall, Wodak *et al.*, 1992; Ross *et al.*, 1997).

Additives such as quinine, strychnine, talc, starch, lignocaine, and lactose can damage the heart valves directly, thus increasing the risk of bacterial seeding of the valves. These agents also cause granulomatous formation in the lung, kidneys, skin and blood vessels. Significant amounts of quinine can cause cinchonism and amblyopia, strychnine can cause opisthotons and life-threatening seizures (Chiang and Goldfrank, 1990).

U.K. researchers recently completed a study that highlights the importance of secondary harms from injecting drugs.

Current status:

- No studies are known to be underway.

Emerging issues:

- Need to conduct research into secondary harms from injecting such as vein damage.

6.0 INTERVENTIONS TO REDUCE DRUG-RELATED HARMS

6.1 PRIMARY PREVENTION

Primary prevention initiatives aim to prevent the onset of drug use among non-drug users and/or novice drug users (van der Stel & Voordewind, 1998). The most commonly evaluated strategies in the illicit drug area are educational approaches such as mass media campaigns and school-based programs, and law enforcement responses to cannabis availability. Some progress has also been made in the development of codes of practice for dance venues attended by illicit drug users. These approaches are outlined below. Additional references on the impact of law enforcement on the illicit drug market are noted in Section 4.3. See Spooner (1998), Dietz (1998) and Paglia & Room (1998) for details of other approaches (eg. social skills training).

Spooner (1998) notes the following five key concepts for best practice in primary prevention as indicated by previous research. Programs need to be: (1) comprehensive and consider the range of social influences and institutions (eg. schools, parents, peers, media, police); (2) long-term rather than one-off; (3) age-specific, developmentally appropriate and culturally sensitive; (4) based on research knowledge and include sound methods; and (5) evaluated for both positive and negative effects.

6.1.1 MASS MEDIA

There have been few mass media campaigns targeting illicit drug use during the past decade. The "Grim Reaper" national AIDS campaign (Morlet, Guinan, Diefenthaler & Gold, 1988) was conducted just prior to 1988, as were an anti-heroin use campaign called "Heroin Screws You Up" (Plant, Macaskill, Kai Lo & Pierce, 1988) and the Get Real Project (Wodak, McArthur & Carroll, 1990). In 1990, the Federal Minister for Community Services and Health launched a national AIDS campaign which targeted recreational injecting drug users and 16-24 year olds (Butt, 1990). This campaign included TV, print, radio and cinema advertisements which aimed to highlight the personal risk of AIDS infection, to alter attitudes to condom use and safe needle practices, and to encourage behaviour changes to reduce the risk of HIV infection. State governments supplemented the campaign with a number of community education projects (Butt, 1990).

The "Speed Catches Up With You" campaign was conducted from 1993 onwards, and aimed to deter the use of amphetamines among both non-users and novice users (cited in Hando, 1997). It involved disseminating information about the risks of amphetamine use via television and cinema advertisements, billboards and other signs, radio advertisements, magazines and information brochures, sponsorship of dance parties, a record album and a

school teaching kit. The themes highlighted the health risks of amphetamine use, namely, overdose, dependence ("Speed catches up with you"), HIV risk ("AIDS hits speed users too"), and the risks of adulterants and contaminants ("The people who make speed don't test it on animals - they use people!").

Two stratified probability surveys were conducted to establish baseline measures and evaluate the campaign. Awareness of the campaign was high, with up to 91% of the target group recalling at least one element of it, and three quarters saying that the campaign had made them more aware of the negative effects of amphetamines. However, few behavioural changes were noted among the target group. The proportion of those who had tried amphetamines remained steady.

More recently, the Victorian government has distributed a booklet on the hazards of drug use to every household in the State, as part of its multi-faceted "Turning the Tide" drug strategy. A similar campaign has been conducted in WA.

Overseas research has found that mass media campaigns are unlikely to result in significant behaviour changes among their target audience (EMCDDA, 1996; Paglia & Room, 1998), although do not always have to be ineffective (Spooner, 1998; Paglia & Room, 1998).

Current status:

- The Federal government is developing a number of initiatives in this area, including a review of the relevant research to assist in the development of targeted communication strategies to prevent illicit drug problems. These will include both primary and secondary initiatives, and initiatives which target adults/parents and adolescents.
- The Centre for Adolescent Health is evaluating the Program for Parents (PfP) conducted by Jesuit Social Services. This program aims to reduce the negative impact of risk factors for a number of adverse outcomes, including substance abuse and suicide.

Emerging issues:

- There is a need to incorporate previous research on the effectiveness of mass media strategies into the design of future campaigns and to fund adequate evaluations of new campaigns (preferably on a large pilot basis before mass dissemination).

6.1.2 SCHOOL EDUCATION

School-based drug education programs in Australia largely focus on alcohol and tobacco. There tends to be little, if any, focus on illicit substances. An example of such a program is Life Education, which provides limited information to school children on the effects of drug use for fear of exciting curiosity and experimentation. Such programs are rarely evaluated. When they are, results in terms of impact on drug use tend to be equivocal at best and on occasion unresponsive to these types of messages (Hawthorne, Garrard & Dunt, 1995; Paglia & Room, 1998). A recent meta-analysis of the effectiveness of interventions to reduce or prevent illicit drug use by young people (White & Pitts, 1998) found that the impact of interventions was small, with dissipation of program gains over time. However, the majority

of programs had the same direction of effect favouring the educational program. This evidence suggests that current school-based programs provide short-term delays in the onset of substance use by non-users and a short-term reduction in the amount of use by some current users.

Current status:

- The Centre for Adolescent Health has developed the Gatehouse Project, which is a school-based project aimed at enhancing teacher and parent communication (and thus avoid the onset of emotional problems that are associated with substance abuse).
- CEIDA is conducting a review and consultation process in NSW of school-based drug education.
- Other State governments are also addressing the issue of school-based drug education.
- In Victoria a recent initiative called "Turning the Tide" was carried out looking at reducing the harms associated with alcohol and cannabis use, and utilised media and peer education work.
- The Federal government has appointed an expert committee to advise on school-based drug education.
- The Federal government recently commissioned the development of a teacher education "Candidly Cannabis" kit, which provides information for high school students.

Emerging issues:

- There is a need to develop effective drug education programs in schools to prevent and reduce escalating levels of drug use (particularly cannabis) among secondary school students (see section 3.2.1).
- In-depth qualitative studies in schools.

6.1.3 CANNABIS LEGISLATION

A series of linked studies have been conducted in South Australia and Western Australia on the impact of legislative options for cannabis use offences on rates of cannabis use, law enforcement and offenders who are prosecuted for cannabis offences (Ali, Christie, Lenton *et al*, 1998). One study has examined household survey data on trends in cannabis use in South Australia, which has introduced a Cannabis Expiation Notice (CEN) System whereby those who are found in possession of cannabis are given a warning rather than charged. The rate of increase in South Australia between 1985 and 1995 has been compared to that in States that have not changed their laws. Other studies have examined the way in which cannabis use offences are dealt with in the CEN system in South Australia and in the Western Australian criminal justice system, including the experiences of persons charged with these offences. An evaluation of the effect of cannabis decriminalisation in the ACT on students' cannabis use has also been carried out (McGeorge & Aitken, 1997).

Current status:

- The social impact of the CEN scheme in SA is being evaluated.

- There is a national study comparing the social impacts of different legislative options for cannabis in Australia.

Emerging issues:

- Cannabis cautioning schemes and their evaluation.
- Evaluation of recent cannabis expiation notice schemes in ACT and NT.
- Impact of International Treaties on non-prohibition models of cannabis possession, use and supply.
- Issues of supply under various legislative models.
- Impact studies of new policing/legal strategies.

6.1.4 CODES OF PRACTICE FOR DANCE VENUES

A study conducted in 1997 found that most dance venues contribute to the health and safety risks of drug users who attend these venues (Hando, Dillon, Topp & Rutter, 1998). National and State protocols for conducting safer dance parties and preventing drug-related problems have been developed in Australia (National Protocols for Conducting Safer Dance Parties, 1996; NSW Ministry for Police, 1997; Health Department of WA, 1995). Generally, these recommend the adequate provision of water, ventilation, chill-out areas, medical assistance, security checks, and information to users. As part of a national ecstasy campaign funded by the Federal government ("Project E"), an information kit was developed and disseminated to venue operators and promoters in QLD, NSW and SA during 1997. However, no initiatives in this area have been formally evaluated.

Current status:

- Guidelines have been disseminated.

Emerging issues:

- Need to evaluate the uptake and impact of protocols.

6.2 SECONDARY PREVENTION

Secondary prevention strategies aim to reduce problems among current drug users at an early stage (van der Stel & Voordewind, 1998). They include targeted information dissemination programs, self-help strategies, needle exchange programs and injecting rooms.

6.2.1 INFORMATION DISSEMINATION

Information campaigns have targeted stimulant, heroin and cannabis users in Australia. A major secondary prevention activity implemented in 1993 among amphetamine users was the "Speedwise-Speedsafe" campaign (Berg, 1994). This was a "narrowcast" project that provided specific harm reduction messages for current amphetamine users that did not emphasise quitting. The campaign used postcards that were distributed at nightclubs, dance-

party venues, pubs, needle exchanges, health services and shops frequented by the target group. The content of the material stressed the need for users to keep hydrated and well nourished, to avoid binge use, not to combine intoxicating doses of alcohol and amphetamines, and to observe standard precautions against HIV infection when injecting. While this campaign was implemented in several Australian States, it was not rigorously evaluated. The evaluation consisted of discussions with 34 amphetamine users. Most of the target sample recognised the campaign logo, and substantial numbers were familiar with the specific campaign messages. Significant improvements were only noted in the knowledge of syringe cleaning procedures and of the association between concurrent amphetamine and alcohol use and intoxication. Many users requested additional information on vein management (Berg, 1994; Kamieniecki, Vincent, Allsop & Lintzeris, 1998).

The "Rave Safe" campaign was one of numerous projects undertaken during the 1990s by the NSW Users and AIDS Association (NUAA) as part of their Tribes campaign (cited in Kamieniecki *et al.*, 1998). It provided information to "ravers" on the adverse effects of party drugs, and the risks of needle sharing and unsafe sex, and was generally well received. In 1997, a national information campaign entitled "Project E" funded by the Commonwealth Department of Health also developed a range of resources for patrons of dance venues, which included information on the risks of drug use (ecstasy in particular), levels of water consumption, how to avoid overheating and when to seek help.

There have been numerous other information materials providing harm reduction messages to illicit drug users in Australia, but few have been formally evaluated. For example, NDARC has developed a number of information pamphlets for users of various substances (eg. cannabis, amphetamines, benzodiazepine injection, steroids), as have the NSW Department of Education, the NSW Police Force (focussing on legal issues) and DASC. The Commonwealth Department of Health and Family Services commissioned a review of the harmful effects of ecstasy (White, Irvine & Bochner, 1996). Some of these materials provide information to parents.

In South Australia, an intervention aimed at reducing the incidence of heroin overdose has been developed (Ali, McGregor, Hall & Darke, 1997). It consists of information materials in a variety of formats (poster, booklet, postcards, fridge magnets) with messages which include: never use heroin alone, don't use cocktails, know the strength of the drug being injected, identify risky situations and times, call for help in cases of emergency, and other advice on what to do. Peer educators were trained to assist heroin users to identify risky injecting behaviours, consider alternative lower risk behaviours, manage narcosis and use emergency services. The project was also supplemented by negotiations with police, ambulance and accident and emergency services to ensure a consistent harm reduction focus in their actions. This intervention has been evaluated but a final report is not yet available.

Following the development of the SA overdose project, CEIDA developed a similar project in NSW, with direct involvement of heroin users at all stages of the project (Gore, 1997). The project was evaluated by focus groups and a small number of interviews with heroin users (n=40) in which some changes in knowledge and behaviour were noted, although statistical analyses were not conducted. Only one peer approach among amphetamine users has been formally evaluated. This was a study conducted in the U.K. by Klee and Reid (1995) which examined the feasibility of peer education as a prevention tool among amphetamine users. It

found that some messages (e.g. deterring transitions to injecting or heroin use) are more likely to be accepted when delivered by drug using peers.

While necessary, the provision of education and information alone has not been found to completely reduce harmful drug use and HIV risk-taking behaviour (eg. Caslyn, Saxon, Freeman & Whittaker, 1992; Dietze, 1998; Darke, 1992), although peer approaches show some promise.

Current status:

- The NSW Health Department is developing a pamphlet for parents on cannabis use.
- A peer intervention to reduce heroin overdose in WA is being evaluated.

Emerging issues:

- The effectiveness of peer approaches is worthy of further investigation.
- Gap between knowledge and behaviour.

6.2.2 SELF-HELP STRATEGIES

Instances of "untreated cessation" of drug use have been noted among drug users (eg. Hando, 1997; Copeland, 1997). "Self-help" educational materials (distinct from self-help groups based on the 12-step philosophy) in which the user works through a number of activities designed to enlighten them about the risks of illicit drug use may assist them to change without seeking formal treatment. Such materials could also be used by clinicians during the course of treatment, or as part of a brief intervention, and represent a potentially cost-effective response to illicit drug problems in the community. A number of such resources have been developed in Australia which provide information on a range of goals, including controlled use and quitting (eg. NDARC, 1997; Lintzeris, Dunlop and Thornton, 1996; Grenyer, Solowij & Peters, 1995).

Current status:

- A self-help guide for amphetamine users is currently undergoing evaluation in South Australia.

Emerging issues:

- Effectiveness and cost-effectiveness of this approach.

6.2.3 NEEDLE EXCHANGES

Needle and syringe exchange programs have been very effective in the prevention of HIV infection in Australia (Feachem, 1995) and abroad (Hurley, Jolley & Kaldor, 1997). Several studies show that NSEPs can reduce injecting risk-taking behaviour (Darke, 1992). A comprehensive review of the NSW Needle and Syringe Exchange Program found that about

15 million needles and syringes were distributed annually in Australia at a cost of \$1 each. There were about 718 NSEP outlets and 3,400 pharmacies selling syringes in Australia in 1995 (MACAS, 1996).

A survey of clients of the WA Pharmacy Syringe Exchange Program found they were somewhat different to the IDUs sampled in ASHIDU. For example, almost half of the pharmacy clients were employed and only one quarter reported being positive for hepatitis C infection (Lenton & Tan-Quigley, 1997).

In two telephone surveys, a random sample of residents was quizzed about their level of support for a range of drug services. In 1990, 90% of respondents expressed support for needle and syringe exchange programs (Drug and Alcohol Directorate, 1990). In 1997, 87% of residents living in and around Kings Cross (postcode 2011) expressed support for needle and syringe exchange programs (M. MacDonald, personal communication, 1998; see also Lenton & Phillips, 1997; Lenton & Jacobs, 1995).

Current status:

- There are regular surveys of NSEP clients.
- The Kirketon Road Centre has opened another centre (K2) in the main street of Kings Cross. A follow up evaluation of the community response to the Centre will be completed by the end of 1998.
- A qualitative study of the impact of the closure of a Sydney NSEP was being carried out in 1998.
- The 1998 Household Survey included assessed respondents' support for a range of measures including needle exchanges.

Emerging issues:

- The bipartisan political support for NSEP appears to be dwindling. This could threaten funding for the program and control over HIV.

6.2.4 INJECTING ROOMS

An injecting room is a clinically supervised place where IDUs can inject drugs and receive care and attention, if so needed. They are distinct from "shooting galleries", which are run for a profit with little attention to health matters. Evidence from Europe indicates that injecting rooms are beneficial to drug users (Joint Select Committee into Safe Injecting Rooms, 1998). The number of overdose deaths has decreased dramatically in Frankfurt since the introduction of injecting rooms. This figure rose from 31 in 1985 to a peak of 147 in 1991 (the year injecting rooms were introduced) and fell to 31 in 1996. Injecting rooms are also thought to have facilitated IDUs entry into drug treatment in Germany.

There is some indication that IDUs using illegal shooting galleries in Sydney were less likely to share syringes than IDUs injecting at home or in public places (Rutter, Dolan & Wodak, 1997). Six percent of IDUs in the 1997 NSEP survey reported injecting in shooting galleries in the previous month- with the vast majority doing so in NSW (12% of IDUs in NSW)

(MacDonald, 1997). A telephone survey of residents in and around Kings Cross found 64% were in favour of the provision of injecting rooms (M. MacDonald, personal communication, 1998). However, many Indo-Chinese drug users in south west Sydney have reported that they would not use injecting rooms, suggesting possible cultural differences in the attractiveness of such an option (Maher, Dixon, Swift & Nguyen, 1997).

The New South Wales Parliamentary Inquiry into Safe Injecting Rooms examined the economical, social and health reasons for and against the establishment of such a service (Joint Select Committee into Safe Injecting Rooms, 1998). Although much of the evidence was favourable, the Committee decided against the establishment or trial of injecting rooms in NSW.

Current status:

- Two States are investigating the possibility of a trial of injecting rooms.
- A number of illegal shooting galleries continue to operate in Kings Cross. Research in to these premises may ascertain whether they are of any benefit to IDUs.
- The 1998 Household Survey included questions assessing individuals' support for safe injecting rooms.

Emerging issues:

- A trial of injecting rooms would answer many questions about the usefulness or otherwise of injecting rooms, including estimates of the costs and benefits and measurements of unintended negative consequences.

6.3 TERTIARY PREVENTION

Tertiary prevention strategies provide treatment for problematic drug use (van der Stel & Voordewind, 1998). They include detoxification programs, pharmacological interventions, psychological interventions, alternative interventions, and interventions for special groups, such as women, youth, injecting drug users and prisoners.

6.3.1 DETOXIFICATION

Most of the research on detoxification has been on opioid dependence. The majority of opioid addicts relapse to heroin use shortly after detoxification (Gernstein & Harwood, 1990). Furthermore, prospective controlled studies show that people who have undergone detoxification are no less likely to relapse to drug use than those who have not (cited in Mattick & Hall, 1996). As such, Mattick & Hall (1996) suggest that detoxification programs should not be regarded as treatment for drug dependence *per se*, but rather as a way to achieve a safe and humane withdrawal from a drug of dependence.

The effectiveness of different opioid withdrawal regimens has been well-researched and reviewed (eg. Ward, Mattick & Hall, 1998a). Methadone is generally the main agent used to assist with heroin withdrawal and has been found to be an effective method of achieving opioid withdrawal, especially when compared with completion rates of self-detoxification

attempts (Mattick & Hall, 1996). Methadone-assisted withdrawal has been found to be marginally better than other agents such as clonidine in terms of rates of completion and the experience of withdrawal symptoms, although some potentially serious side effects have been noted for clonidine. Buprenorphine has shown some potential for managing opioid detoxification, where it appears to be equivalent to methadone and superior to clonidine and other drugs (Mattick & Hall, 1996).

Rapid opiate detoxification under anaesthetic (RODA) has recently been promoted in Australia and other countries as a treatment for opioid dependence in which detoxification is achieved within 24 hours by administering naltrexone under general anaesthesia (Hall & Mattick, 1997). This is followed by up to a year's maintenance on naltrexone. While there is good evidence that naltrexone accelerates opiate withdrawal, and that general anaesthesia does prevent patients from experiencing withdrawal symptoms (Hall, Mattick, Saunders & Wodak, 1997), assertions of the efficacy of RODA are derived from uncontrolled studies of highly selected patients (Hall & Mattick, 1997). So far it has not been proven to be either an effective or cost-effective detoxification or maintenance treatment for opioid dependence (Hall & Mattick, 1997; see also section 6.3.2.2), a view supported by the National Institute on Drug Abuse in the U.S. (cited in Hall *et al.*, 1997). Naltrexone-assisted detoxification can be accomplished in conscious patients using clonidine and short-acting benzodiazepines to manage withdrawal symptoms, although this requires further investigation (Hall & Mattick, 1997).

Mattick & Hall (1996) note that the emphasis on pharmacological approaches to opioid detoxification has led to a neglect of the psychosocial methods that have been successful with alcohol detoxification. The efficacy of other methods remain to be demonstrated (eg. cranial electrostimulation, cross-cultural approaches).

Kamieniecki *et al.* (1998) note that there has been little research on the management of psychostimulant withdrawal, and that withdrawal management consists primarily of non-pharmacological strategies which may be supplemented with medications. Several recent U.S. papers (eg. Mendelson & Mello, 1996; Withers *et al.*, 1995; Tutton & Crayton, 1993; McCance, 1997) review pharmacological interventions other than substitution that have been trialed for treating cocaine problems. These medications, including desipramine, bromocriptine, buprenorphine and amantadine, may be used in conjunction with other forms of treatment to obtain and sustain abstinence by reducing the discomfort of withdrawal. However, side-effects and delayed onsets of action have been noted as problems with these agents. Moreover, there have been few controlled trials, and the results have been inconsistent.

There has been limited research into the extent and effectiveness of home detoxification programs and/or GP assisted detoxification for illicit drug dependence (eg. Anselme & Stanhope, 1996), however an examination of different models of withdrawal from methadone and heroin has been completed by Turning Point Alcohol and Drug Centre, which included home-based withdrawal programs.

Data quality:

- There have been few controlled studies of effective pharmacological and psychological detoxification procedures for illicit drugs.

Current status:

- Guidelines for the management of amphetamine withdrawal are currently being developed by staff from Turning Point Alcohol and Drug Centre.
- A recent review of withdrawal services and models has been conducted by Turning Point. This includes an examination of rural, community residential, home-based and outpatient models.
- Self-help booklets for withdrawal from methadone and heroin have been produced by Turning Point.
- A number of clinical trials are examining alternative pharmacological agents for opioid detoxification eg. Turning Point are examining the efficacy of buprenorphine as a withdrawal agent for methadone and heroin.
- The Evidence-Based Practice Unit (at DASC) is currently reviewing evidence on the management of opioid withdrawal, following standards set by the Cochrane Collaborative Review Group on Drugs and Alcohol, and the NH&MRC.

Emerging issues:

- More research is needed to establish the efficacy of opioid withdrawal agents other than methadone (eg. buprenorphine, naltrexone, lofexidine), and the efficacy of non-pharmacological approaches for opioid withdrawal.
- Research also needs to identify effective strategies for stimulant withdrawal.
- The prevalence and role of home and ambulatory detoxification.
- Better measures of the extent and effectiveness of GP-assisted and home detoxification.
- Naltrexone and lofexidine could be examined separately from buprenorphine as agents for assisting opioid withdrawal.
- The cost-effectiveness of withdrawal intervention models could be evaluated (home-based, outpatient and residential).
- The place of herbal aids and traditional medicines in detoxification.

6.3.2 PHARMACOLOGICAL TREATMENTS

6.3.2.1 *Methadone*

The international and Australian literature on methadone maintenance treatment has been reviewed by Ward, Mattick & Hall (1998a). Methadone maintenance treatment (MMT) is the earliest form and continues to be the most widely used form of opioid replacement therapy in Australia. Controlled trials and large observational studies show that MMT is effective in retaining clients in treatment, in reducing opioid use and in reducing crime, compared to no treatment (Hall, Ward & Mattick, 1998a). Comparative observational studies show that programs with higher doses, a maintenance goal and ancillary services have better outcomes.

There is reasonably strong evidence that MMT reduces injection-related HIV risk-taking behaviour and thereby reduces the risk of HIV infection among this population (Ward, Mattick & Hall, 1998b). However, this is clearest in programs that use adequate doses of methadone (>60 mg per day) and adopt maintenance rather than abstinence as a goal of treatment. There are few studies that have examined the relationship between exposure to MMT and hepatitis B and C, and the evidence from these studies is contradictory. MMT may be unlikely to have a protective effect in this area, as these viruses appear more virulent than HIV, and injecting drug users have usually been exposed to them by the time they present to treatment (see also Crofts, Nigro, Oman *et al.*, 1997).

Research has also found that MMT is associated with a four-fold decrease in fatal opioid-related overdose (Caplehorn, Dalton, Haldar *et al.*, 1996) and with a substantial reduction in deaths from all causes (Zador, Sunjic & Basili, 1998).

Darke (1998) outlines variables that have been associated with riskier behaviours and a poorer outcome in MMT. These include polydrug use (especially benzodiazepines and cocaine), psychopathology (eg. antisocial personality disorder) and methadone diversion.

In Australia in recent years, there has been a greater focus on economic issues in the delivery of MMT as demand for it continues along with demands for increased efficiency in the health care system (Hall, Ward & Mattick, 1998b; see also Ward & Sutton, 1998). The private medical sector has become much more prominent in the delivery of methadone, through psychiatrists, general practitioners and community pharmacy dispensing, which are more affordable than multi-disciplinary public clinics. The use of alternative opioid maintenance drugs such as buprenorphine and LAAM has also received greater research focus as potentially more cost-effective agents.

There has also been a greater interest in service systems research, including the evaluation of treatment models, service delivery and client pathways to care (eg. Rush, 1996).

Hall, Ward & Mattick (1998b) identify a number of priorities for research into improving the effectiveness and more efficient delivery of MMT which are summarised below, along with stakeholder suggestions.

Current status:

- Research into low threshold methadone programs has recently been completed in Victoria and South Australia (i.e. Methadone Access Program).
- Turning Point has conducted a number of evaluations of methadone service delivery, including the Evaluation of Specialist Methadone Services, and the Evaluation of Community Based Methadone Services.
- The Commonwealth Department of Health is conducting a pilot study on funding mechanisms of MMT.
- NUAA is conducting a study on MMT, NSEP and methadone injection.

Emerging issues:

- Research on the impact of dispensing fees among private methadone clients (eg. on treatment retention, drug use and crime).
- Systems of methadone delivery.
- Research into the effectiveness of ancillary services related to methadone provision eg. counselling, primary health care, vocational guidance and budget skills training.
- The impact of MMT in reducing HCV.
- Long-term cohort studies of heroin users to understand their drug-using careers, including factors that influence abstinence, treatment seeking, demand for MMT and recovery from illicit drug problems.
- Evaluation of alternatives to MMT, such as buprenorphine and LAAM, including their efficacy, cost-effectiveness and attractiveness to clients (see next section).
- The effects of mainstreaming MMT in primary health services, including the funding implications, health and social outcomes.
- Methadone diversion, including the effectiveness of strategies to reduce this practice (see also section 5.2.1.2).

6.3.2.2 *Other pharmacotherapies for opioid dependence*

Recent work has examined the specific efficacy of alternative opioid replacement therapies, including LAAM (levo-alpha-acetylmethadol), buprenorphine, heroin (diacetylmorphine) and naltrexone (Mattick, Oliphant, Ward & Hall, 1998; Mattick, Oliphant, Ward, Hall & White, 1997). This research has been prompted by a recognition of the importance of patient choice in treatment entry, retention and outcome, and the documented negative characteristics of MMT (see also Mattick & Hall, 1993). The latter include: dependence on methadone; the potential for overdose from methadone among tolerant and non-tolerant individuals; the inconvenience of daily dosing; the diversion of takeaway doses; the stigma associated with MMT, which may act as a barrier to treatment entry; and the desire among some users to inject methadone rather than ingest it orally.

LAAM is a synthetic opioid analgesic which has been shown to be an effective oral maintenance agent in a number of randomised controlled trials. Its advantages over methadone include: a longer half-life that allows dosing every 2-3 days; greater flexibility for the patient; and less opportunity for illicit diversion.

Mattick *et al.* (1998) summarise the disadvantages of injectable heroin maintenance such as the short half-life of heroin which requires frequent and costly administration, the risk of diversion, the difficulty in stabilising patients, and the risks associated with injecting drug use. However, proponents argue that it may be effective in attracting and retaining heroin users in treatment (cited in Mattick *et al.*, 1998). There has been one controlled study of the effectiveness of injectable heroin maintenance which produced mixed results: oral methadone was associated with poorer retention in treatment, but also lower levels of daily opioid use and injecting, compared to heroin. More recently, the Swiss have investigated the value of heroin prescribing in a multi-site trial. Preliminary results suggest that the costs of providing

heroin are twice that of methadone, although good retention in the heroin arm has been documented.

Between 1991 and 1997 the National Centre for Epidemiology and Population Health undertook a substantial program of research exploring the feasibility of a controlled trial of medical prescription of heroin for opioid dependent persons. This involved a large number of separate studies of: ethical issues, community and consumer attitudes to such a trial, study design, estimating the potential number of trial participants, and the logistics and practicality of providing heroin maintenance treatment. A decision was made by the Prime Minister in August 1997 not to proceed with the trial but the research has produced a substantial number of publications (eg. Bammer, 1993, 1995a, 1997; Bammer & Douglas, 1996; Bammer, Dance, Stevens *et al.*, 1996; Dance, Crawford, Ostini *et al.*, 1997; McDonald, Stevens, Dance & Bammer, 1993). The major reports on the feasibility of such trials (Bammer, 1995b) have informed the efforts of other countries considering trials of heroin prescribing.

Open trials and randomised studies have shown that buprenorphine, which is a mixed agonist-antagonist, to be as effective as methadone in reducing illicit opioid use, retaining clients in treatment, and in reducing withdrawal symptoms. It has been found to be acceptable to heroin users, has few side effects, appears to induce a low level of physical dependence, diminishes self-administration of heroin, induces a relatively mild withdrawal syndrome, is safe and has a long duration of action (see Mattick *et al.*, 1998). Its limitations include the sublingual route of administration, which may prove cumbersome and inconvenient; the ease with which it can be injected; and a ceiling effect that may limit its applicability to more severely dependent clients. Recent research suggests that a combination of buprenorphine and naloxone may reduce its abuse liability (Ling *et al.*, 1998; Fudala *et al.*, 1998). There has also been examination of optimal dose levels of buprenorphine (Ling *et al.*, 1998).

Naltrexone is a long-acting opioid antagonist with mild side effects and flexible dosage regimens. Substantial drop-out rates have been reported in research, it has been found to be less attractive to heroin-dependent people than methadone, and has not been proven to be superior to placebo treatment in controlled trials (Hall & Mattick, 1997). Its efficacy has been demonstrated among selected and highly motivated patients who wish to cease opioid use. A recent Australian pilot study of its use among patients presenting to a public hospital for treatment for opiate dependence (Foy, Sadler & Taylor, 1998) found that it was well tolerated and associated with a significant abstinence rate, even though compliance during the 12 month study was low. The authors suggest that a double-blind controlled trial would be justified.

Australian research into the feasibility of new pharmacotherapies recommended several research trials (Ritter, Kutin, Lintzeris & Bammer, 1997). Currently there are a number of pharmacotherapy trials either in progress or planned in several Australian States, examining naltrexone, buprenorphine, LAAM and slow oral morphine maintenance (see also section 6.3.1). These are being overseen by a national project (NEPOD; National Evaluation of Pharmacotherapies for Opioid Dependence, based at NDARC) which provides technical support to these trials, monitors and evaluates their process and outcomes, and will assist in the dissemination of results.

Data quality:

- While Swiss research evaluating heroin prescription has produced some encouraging results and stimulated similar research in other countries, the design does not allow definitive conclusions.

Current status:

- A variety of trials into the effectiveness and cost-effectiveness of buprenorphine, LAAM, naltrexone and slow-release oral morphine maintenance are planned or in progress, overseen by a national project (NEPOD).

Emerging issues:

- Efficacy, safety and patient acceptability of other opioid maintenance therapies.

6.3.2.3 *Amphetamine substitution*

Kamieniecki *et al.* (1998) note that amphetamine substitution therapy has been used for a number of years in the U.K. Initial research conducted during the 1960s in London noted adverse effects associated with this treatment, such as frequent psychotic episodes, malnutrition, weight loss, sleep disturbance and dependence. These conclusions influenced the lack of support for this treatment approach over the next 20 years. The more recent interest in amphetamine prescribing in the U.K. stems from the popularity of injecting amphetamines and the desire to reduce the spread of blood-borne viruses through unsafe injecting practices.

Mattick and Darke (1995) suggest that amphetamine substitution may be appropriate where amphetamine use is frequent, dependence is evident, lifestyle is severely and adversely affected, and maintenance is associated with fewer harms than illicit drug use. They note, however, that there are risks associated with such therapy, including the potential for increased drug use and psychiatric and neurotoxic effects from prolonged use of the drug. They note that studies in the area are of poor quality, and rigorous controlled trials are needed before firm conclusions can be drawn about the efficacy of such programs. Preliminary results from a current matched-case control study in the U.K. comparing amphetamine users in and out of treatment show promise in that most of those receiving pharmacotherapies had stopped or reduced their amphetamine use (ISDD, 1996). A community survey of amphetamine users in Sydney (Hando, Topp & Hall, 1997) found some demand for this treatment modality (by 18% of subjects), suggesting that it may warrant further research in Australia.

Current status:

- A pilot randomised control study in Sydney is currently examining the feasibility of urinary isomer monitoring of dexamphetamine prescribing as a treatment for amphetamine dependence, including whether or not urinary monitoring can separate patients taking prescribed medication and street amphetamine. Preliminary results suggest

that the evaluation of dexamphetamine prescription for amphetamine dependent persons is feasible.

Emerging issues:

- More controlled studies are needed to determine the efficacy of this treatment.

6.3.2.4 Cocaine substitution

Kamieniecki *et al.* (1998) note recent trials of the prescription of cocaine as a substitute therapy for cocaine dependence that have been conducted in Peru. Results from both controlled and uncontrolled trials found reduced relapse to heavy, illicit cocaine use and reduced cravings for the drug. In contrast, a randomised control trial of methylphenidate as replacement therapy for “uncomplicated” cocaine dependence has been conducted in the U.S. by Grabowski, Roache, Schmitz *et al.* (1997). It found that there was no difference in retention or cocaine use according to control or treatment group status, suggesting that there may be important pharmacokinetic differences that reduce the efficacy of this medication.

Current status:

- There are no research projects on this topic in Australia.

Emerging issues:

- Indications of hazardous and harmful cocaine use among injecting drug users in Sydney (see section 5.2.1.5) suggest that some thought needs to be given to the issue of treatment for cocaine problems. Development of such interventions is hampered by a lack of current research into patterns of use, treatment needs and preferences of this group. Low levels of problematic cocaine use in Australia may also make recruiting adequate numbers of cocaine users into studies difficult. However, a review of the U.S. literature on neuropsychological effects could provide direction for the development of interventions to improve the long-term prognosis of cocaine users.

6.3.2.5 Pharmacotherapies for benzodiazepine dependence

Benzodiazepine abuse is widespread among heroin users, as is the injection of benzodiazepines (see section 5.2.1.2). Such abuse has been linked to higher levels of risk taking, poorer health and psychological functioning. A pilot trial of benzodiazepine maintenance using the long-acting clobazam among high-dose benzodiazepine dependent methadone clients has recently been completed by staff from NDARC and South Western Sydney Area Health Service (Shane Darke, personal communication, 1998). It aims to determine the feasibility of this treatment in reducing the substantial harms associated with benzodiazepine abuse. Results are not yet available.

6.3.3 PSYCHOLOGICAL TREATMENTS

The bulk of the research in this area is for primary opiate and cocaine problems, with few studies examining psychological interventions for other illicit drug problems. The alcohol literature is drawn upon when no research on aspects of psychological interventions for illicit drug problems exist (eg. matching clients to treatment). Generally, drug free treatments have been found to attract fewer patients than MMT, have lower rates of retention in treatment, and lower rates of successful graduation to a sustained drug-free lifestyle (Gerstein & Harwood, 1990). Several large-scale prospective studies comparing the effectiveness of different treatments for drug problems have recently been conducted in the U.S. and the U.K. These studies provide an important bridge between the results of clinical trials and the effectiveness of treatments as delivered under ordinary clinical conditions.

6.3.3.1 *Large-scale comparative studies in the U.S. & U.K.*

CALDATA (California Drug and Alcohol Treatment Assessment) is a large-scale pre-post study of the effectiveness and cost-effectiveness of drug and alcohol treatment in California (Gerstein, Johnson, Harwood *et al.*, 1994). It randomly selected 3,055 clients during 1991-92 from five treatment modalities: residential programs; social model recovery houses; outpatient non-methadone maintenance; MMT; and MMT and detoxification (both residential and outpatient). Follow-up interviews were conducted with 1,859 subjects on average 15 months after treatment. It found: a reduction in drug use among 40% of subjects, an effect which was greater among those with alcohol and stimulant problems; a 17% improvement in self-reported health, verified by a decrease in hospitalisation; and a two-thirds decline in criminal activity, which was greatest for the social model recovery group and least for the discharged methadone group. It concluded that treatment was cost-effective because of reductions in crime.

The National Treatment Outcome Research Study (NTORS) examined outcomes from the four treatment modalities for primary illicit drug problems at multiple sites throughout the U.K.: inpatient drug dependence units; residential rehabilitation units; MMT; and methadone reduction programs (Gossop *et al.*, 1997). A total of 1075 subjects were sampled, 809 of whom were followed up at six months. It found significant reductions in: the use of illicit opiates across all four modalities; injecting drug use and needle sharing across all four modalities; amphetamine use by MMT clients; and stimulant and alcohol use in the rehabilitation group.

The Drug Abuse Treatment Outcome Study (DATOS) is a national multi-site prospective cohort study of community-based treatment for drug and alcohol problems in the U.S., conducted between 1989-96 (Flynn *et al.*, 1997). DATOS initially sampled 10,010 clients and conducted 12 month follow-up interviews with 4,229 clients. The four major treatment modalities were: outpatient MMT; long-term residential treatment; outpatient drug-free treatment; and private/public short-term inpatient treatment. It found major reductions in most types of drug use across all treatments. After controlling for other factors, it also found: no non-drug behaviour changes for the outpatient MMT group and short-term inpatient treatment group; reduced crime and increased employment with greater length of stay in the long-term residential treatment group; and improved long-term employment and reduced

suicide ideation in the outpatient drug-free treatment group (see also Simpson, Joe & Brown, 1997; Anglin, Hser & Grella, 1997).

There have been no large scale comparative studies of treatment outcomes for illicit drug problems in Australia. The Quality Assurance Project (QAP) examined the most effective interventions for the treatment of opioid dependence (Mattick & Hall, 1994). It comprised three main components drawn from a similar project in psychiatry: (1) a review of the published treatment outcome literature; (2) a survey of treatment practices used in Australia; and (3) the views of a panel of experts. This information resulted in a set of guidelines that were later developed into a book for clinicians on how to practically apply these guidelines in treatment settings (Jarvis, Tebbutt & Mattick, 1995). Specific findings are summarised in the next section by type of intervention.

Data quality:

- There are no comparable Australian data to CALDATA, NTORS and DATOS.

Emerging issues:

- Large-scale multi-site outcome studies of the effectiveness of treatment modalities for illicit drug problems are desirable in Australia.
- Long-term follow-up studies of former clients to determine recovery from illicit drug problems.

6.3.3.2 *Cognitive behavioural*

Carroll (1996) reviewed 24 randomised controlled trials of cognitive behavioural treatments conducted among adult users of licit and illicit drugs. She found that, across substances of abuse, but most strongly for tobacco, there is good evidence for the effectiveness of CBT compared with no-treatment controls. Most studies compared CBT with other treatments, with less consistent results: some studies indicate the superiority of CBT, while others have shown CBT as comparable to but no more effective than other approaches. Carroll concludes that CBT may hold particular promise in reducing the severity of relapses when they occur, enhancing durability of effects, and improving patient-treatment matching, particularly for patients at higher levels of impairment in areas such as psychopathology or dependence severity.

In terms of studies on specific illicit drugs, a number of randomised comparative studies have reported favourable results of cognitive behavioural interventions among cocaine users undergoing inpatient detoxification (McCusker, Stoddard, Zapka *et al.*, 1992; McCusker, Stoddard, Zapka and Lewis, 1993), inpatient (Malow, West, Corrigan *et al.*, 1994) and outpatient drug treatment (Carroll, Rounsaville & Gawin, 1991; Carroll, Rounsaville, Gordon *et al.*, 1994; Wells, Peterson, Gainey *et al.*, 1994; Hoffman, Caudill, Koma *et al.*, 1996). In particular, relapse prevention has been found to be superior to interpersonal psychotherapy (Carroll *et al.*, 1991) and clinical management (Carroll *et al.*, 1994) for heavy cocaine users and those with psychiatric symptoms such as depression. Mattick & Hall (1994) found no support for the use of cognitive behavioural interventions as stand alone treatments for opiate

dependence, although they may be effective as ancillary components of methadone maintenance. There has been some recent U.S. research on the efficacy of CBT for cannabis dependence, which found that CBT was effective in assisting clients to reduce frequency of smoking or to abstain from cannabis, compared with a control group, over a one year period (cited in Rees, Copeland & Swift, 1997). Cognitive behavioural techniques are gaining more currency as appropriate interventions within the alcohol and other drug treatment field in Australia (Ali, Miller & Cormack, 1992), and are currently being trialed for cannabis dependence (Rees *et al.*, 1997; see also section 6.3.5.2).

Current status:

- A randomised controlled trial of CBT for cannabis dependence is currently being undertaken by NDARC staff.
- A treatment manual for the administration of CBT among cannabis users is being released by NDARC (Rees, Copeland & Swift, 1998).
- A group based CBT and single session intervention for cannabis users has been researched by Turning Point. Clinical treatment manuals are being prepared, and a self-help booklet is being written.
- Clinical treatment protocols for the delivery of CBT for illicit drug users and polydrug users are being developed by Turning Point.
- A pilot study comparing counselling interventions for amphetamine users is being conducted at Newcastle University.

Emerging issues:

- Broadening CBT to special populations (eg. rural populations, methadone clients, adolescents, dually diagnosed clients).
- Development of brief CBT materials for primary health practitioners (eg. GPs).
- Protocols for counselling interventions.
- Characteristics of effective counsellors.

6.3.3.3 *Behavioural*

In terms of behavioural interventions, O'Brien, Childress, McLellan and Ehrman (1990) found that cocaine-dependent patients who received cue exposure integrated with standard treatment had a higher retention in outpatient treatment and more cocaine-free weeks than those who did not. Treatment involved repeated exposure to cues and situations in which the drug is used to reduce the intensity of craving that the user experiences. A recent Australian study (Topp & Lovibond, 1996) has shown that amphetamine users also exhibit the cue reactivity on which cue exposure treatment is based, suggesting that this may be a useful treatment strategy among amphetamine users. Furthermore, multifaceted behavioural therapies which utilise contingency-management procedures and counselling have noted some success in client retention and cocaine abstinence (Higgins, Budney & Bickel, 1994; Higgins, Budney, Bickel *et al.*, 1995), effects which appear to be enhanced when significant others participate in the treatment program (Higgins, Budney, Bickel & Badger, 1994). Mattick and Hall (1993) note no evidence for the effectiveness of stand alone behavioural

interventions for opiate dependence, although they note that take-away methadone doses are effective incentives which encourage drug-free urines among methadone clients.

Current status:

- No projects in this area.

6.3.3.4 *Psychotherapy*

There have been few controlled studies of the efficacy of psychotherapy for illicit drug problems, although case reports suggest some success in this area (Schiffer, 1988). A study by Carroll *et al.* (1991) compared the effectiveness of relapse prevention and interpersonal psychotherapy among cocaine users, and found relapse prevention to be superior to psychotherapy only for heavy cocaine users and those with high levels of psychiatric symptoms. Studies with opioid users have found that supportive-expressive psychotherapy is as effective as cognitive-behavioural techniques (Woody, Luborsky, McLellan *et al.*, 1983; Woody, McLellan, Luborsky & O'Brien, 1987). There has been one Australian study comparing expressive-supportive psychotherapy with a brief intervention/assessment condition for cannabis dependence, although the results have not yet been published (Grenyer, Luborsky & Solowij, 1995). Ritter and Lintzeris (1998) note that while psychotherapy is not usually regarded as an essential ingredient in the treatment of drug problems, it may be more appropriate for clients with a psychiatric disorder or a long-standing behavioural disorder, a conclusion supported by Mattick and Hall (1993).

Current status:

- No projects in this area.

6.3.3.5 *Therapeutic communities*

Mattick and Hall (1993) conclude that therapeutic communities (TCs) are an effective form of treatment for a small number of drug users who find them acceptable, with longer treatment retention and program completion predicting successful outcomes, a finding supported by other Australian studies in this area (Toumbourou, Hamilton, Fallon *et al.*, 1994; Toumbourou, Hamilton & Fallon, 1998; see also Mattick, O'Brien & Dodding, 1998; Howard, 1994). Program graduates were also found to sustain improvements in the areas of employment, drug use and crime. Rawson, Obert, McCann *et al.* (1991) note that TCs with lifelong goals of abstinence may not be appropriate for treating primary cocaine users who often experience high rates of relapse.

Current status:

- Four Victorian TCs are currently being evaluated by Turning Point.

Emerging issues:

- Evaluation of the cost-effectiveness of TCs compared to other interventions.

6.3.3.6 *Self help*

There is little evidence on the effectiveness of self-help groups for illicit drug problems other than cocaine (eg. Mattick & Hall, 1993). Self-help attendance by cocaine users at 12-step programs (AA, NA, CA) has been shown to predict initiation of abstinence within the following month, compared to patients who did not attend self-help groups (Weiss, Griffin, Najavits *et al.*, 1996). A study by McKay, Alterman, McLellan and Snider (1994) found that greater participation in self-help programs at three months after completing an outpatient hospital program predicted less cocaine use at six months, even when patient characteristics and the degree of success in the day hospital program were controlled for.

Evidence for the efficacy of self-help compared to other approaches is inconsistent. For example, Wells *et al.* (1994) conducted an outpatient trial of the 12-step approach and relapse prevention among cocaine users. Subjects in both treatment conditions reduced their use of cocaine post-treatment, and there were no differences in client retention or cocaine use at a 6 months follow-up.

Current status:

- Research has been conducted by staff from Turning Point on Narcotics Anonymous. However, results are not yet available.

Emerging issues:

- Research on self-help treatment programs other than 12 step approaches.

6.3.3.7 *Other*

Mattick and Hall (1994) note that family therapy has not been found to be an effective stand alone treatment for opiate dependence, although it may be a useful adjunct to methadone maintenance for a small number of individuals. There is evidence that aftercare increases the likelihood of success among motivated individuals who have completed their treatment course in more traditional opiate treatments (Mattick & Hall, 1994).

Kamieniecki *et al* (1998) reviewed the literature on multimodal non-pharmacological treatment for cocaine users which incorporate any of the following: behavioural techniques, cognitive strategies, psychotherapy, group versus individual therapy, information and education, family involvement, self-help groups and urinalysis. The few studies conducted in this area report promising results. Recent reviews of the efficacy of combining psychological and pharmacological approaches to treat drug problems have found that outcomes can be enhanced and broadened when treatments are combined (Carroll, 1997; Stitzer & Walsh, 1997). Rounsaville (1998) notes that combined treatments are either superior or equivalent to behavioural or medication treatments alone, although tend to be under utilised because of differences in ideology and training of clinicians.

Several researchers have noted the importance of matching certain clients to particular treatments. However, the results of two parallel random trials which matched alcohol clients (from outpatient and aftercare conditions) to three different treatments (cognitive behavioural coping skills therapy; motivational enhancement therapy; and 12-step facilitation therapy) based on their client attributes found that this had limited value (Project MATCH Research Group, 1997). It is not known whether treatments for illicit drug problems may fit the matching hypothesis.

While most interventions have abstinence from drugs as a primary goal of treatment, controlled-use interventions may also be offered, although these are more common for alcohol problems than illicit drug problems (Ritter & Lintzeris, 1998). There has been little research evaluating the efficacy of controlled-use approaches for illicit drug problems. See section 6.3.5.2 for studies that target other behaviours such as HIV risk-taking.

Current status:

- No studies in these areas.

Emerging issues:

- The balance between pharmacological and psychological interventions e.g. the role of naltrexone combined with non-pharmacological interventions.
- Studies of the effectiveness of matching clients with illicit drug problems to particular treatments are required.
- Effectiveness of controlled-use approaches for illicit drug problems.
- How families can act as harm-reducing agents (plus minimising the distress of families).
- Aftercare issues.

6.3.4 ALTERNATIVE TREATMENTS

6.3.4.1 *Herbal medicine*

The use of herbal therapies for the treatment of drug dependence has had very limited research. Some research has been conducted on herbal therapies for blood borne viral infections such as HIV and HCV. The Hepatitis C Council of Australia (1996) has noted European studies supporting the use of milk thistle and an ongoing Australian study has indicated positive effects from Chinese herbs. There have been reports of widespread use of traditional medicines in Indo-Chinese cities for detoxification and liver cleansing, and the growth of these practices in Vietnam and China (Lisa Maher, personal communication, 1998).

6.3.4.2 *Acupuncture*

Acupuncture has been the most extensively studied alternative treatment for drug dependence. Several U.S. reviews from the mid 1990's provide conflicting results of treatment efficacy from controlled trials. Riet and colleagues (1990) performed a rigorous meta-analysis of past research and noted negative outcomes. Brewington and colleagues (1994) provide a more recent and comprehensive review which concluded that acupuncture is an effective treatment of withdrawal symptoms for alcohol, opiates and cocaine use, possibly due to an analgesic or endorphine producing effect. Richard and colleagues (1995) noted acupuncture's effectiveness as an adjunct to cognitive behavioural therapy for cocaine treatment. A single-blind study testing the effectiveness of acupuncture in the treatment of cocaine users (cited in Rawson *et al.*, 1991) found similar results from an acupuncture group and a sham acupuncture group, until days 12-18 when the acupuncture group provided more cocaine-free urine samples than the other group.

Results from an extensive and ongoing review on the effectiveness of treatment for drug problems in the U.K. found that acupuncture was commonly used among cocaine users, with staff perceiving it to be the most effective treatment modality (ISDD, 1996). A review of its use in the U.S also notes its incorporation into mainstream drug treatment (Bullock, 1998). No controlled studies have been completed in Australia, but clinical reports indicate successful use of acupuncture treatment, particularly among cannabis users (Fernando, 1996).

Data quality:

- While these approaches show promise, there is no definitive evidence of their effectiveness in treating drug problems. These therapies require more rigorous evaluation, but current research paradigms may be inadequate (Bullock, 1998).

Current status:

- Ongoing herbal trials for treatment of hepatitis C infection in NSW.

Emerging issues:

- Well-controlled studies of acupuncture are needed in this area.

6.3.5 SPECIAL POPULATIONS

Ali, Miller & Cormack (1992) note that the treatment system has not met the existing needs of the general population, let alone needs of identified special risk populations.

6.3.5.1 Youth

Because some at-risk adolescents can experience multiple problems, of which drug misuse is just one, they require a multi-faceted treatment response (Spooner, Mattick & Howard, 1996). Treatments designed for adults may not necessarily be appropriate for younger, more dysfunctional populations who may have different treatment needs. Such treatments need to take into account the cognitive, social, physical and developmental issues relevant to these

clients. The effectiveness of specific treatments for adolescents has not yet been proven, although a review of this literature concluded that some treatment was better than no treatment (Spooner *et al.*, 1996).

Specific treatments such as cognitive behavioural interventions, skills training and family therapy appear promising and require controlled studies into their effectiveness. Other issues such as vocational, educational and recreational services are also important. Some adolescents with drug problems may also have comorbid psychiatric disorders, such as attention deficit hyperactivity disorder or eating disorders, which differ from those noted in similarly diagnosed adults (Spooner *et al.*, 1996). The opportunity to intervene while these high risk youth are incarcerated should certainly be utilised as this group are often difficult to locate when not incarcerated and represent one of the most disadvantaged groups of young people in society. Intensity and duration of treatment needs to increase as problem severity increases (Spooner, Mattick & Noffs, 1998). Client retention is therefore an important issue, particularly for youth who have no stable home or who reside in rural areas.

Current status:

- One study by the Ted Noffs Foundation and NDARC examines the effectiveness of treatment for adolescents (PALM; Program for Adolescent Life Management) but its results are not yet available.

Emerging issues:

- Treatment responses for problematic cannabis use, especially among adolescents.
- Effective treatments for adolescents and families.
- Parent skills training.
- How to improve retention.
- Aftercare services, especially for special groups such as rural and homeless youth.
- Treatment for youth within existing structures eg. detention centres, refuges, schools.

6.3.5.2 IDU

In addition to the large body of international literature on the efficacy of methadone maintenance treatment for injecting heroin users, two randomised controlled trials of the efficacy of cognitive behavioural treatment for reducing HIV risk-taking behaviour among IDUs have been conducted in Australia (Baker, Heather, Wodak *et al.*, 1993; O'Neill, Baker, Cooke *et al.*, 1996). Both compared six sessions of a cognitive behavioural treatment with a one session motivational interview and a methadone only control group. They noted reductions in needle sharing among those in the six session CBT group compared to the other conditions, especially during heavy periods of drug use. No differences in sexual risk-taking behaviour, frequency of injecting or drug use were found.

Current status:

- No current studies.

6.3.5.3 *Women*

There have been a few studies in Australia that have examined gender issues in the provision of treatment for alcohol and drug dependence. Copeland and colleagues (Copeland & Hall, 1992; Copeland, Hall & Didcott, 1993) conducted a comparison of client characteristics and treatment outcomes in traditional mixed-sex treatment services and a specialist women's treatment service, noting the special treatment needs of women dependent on alcohol and other drugs, although no significant differences in outcome were found. This was followed by a qualitative study of self-managed change among women who do not present to treatment services (Copeland, 1997). A national study of the characteristics, treatment needs and treatment experiences of women with drug problems was then conducted, which highlighted a number of issues relevant to the provision of drug treatment services among this group (Swift, Copeland & Hall, 1995; Swift & Copeland, 1996, 1998). Among these included the way in which sexual assault issues were addressed, the provision of a safe therapeutic environment and childcare facilities, and other barriers to treatment seeking. Given the complex, inter-related concerns of women who present for drug treatment, Swift and colleagues recommend further research on the relationship between psychological health, substance use and treatment outcome. Since this project, gender issues have received little research attention, although one current study at ANU examines parenting issues among female illicit drug users. Other research has examined the issue of child sexual assault among women seeking treatment for substance problems (Jarvis, Copeland & Walton, 1995).

Data quality:

- While Australian studies in this area have been carefully designed and conducted, Copeland and Hall (1995) note limitations of the treatment outcome study such as the small sample size which could only detect a 'medium' or larger difference between the specialist and traditional mixed-sex services, and its quasi-experimental design which also limited interpretation of the findings. They note only one controlled treatment outcome study so far, which was conducted in Sweden.

Current status:

- One study is in progress at the ANU (Australian National University) that examines parenting and illicit drug.

Emerging issues:

- Studies could examine the relationship between psychological health, substance use and treatment outcome for women (Swift, Copeland & Hall, 1996).
- Copeland and Hall (1995) suggest replication of their treatment outcome study that employs a randomised control trial design and adequate sample size and follow-up intervals, possibly conducted in multiple sites.
- Intervention strategies for subgroups such as women and girls in custody, rural women and Indigenous Australian women.
- Early interventions for female victims of abuse/neglect.
- Research into implementing guidelines from a national needs analysis project would be

desirable.

6.3.5.4 *Indigenous Australians*

While a number of indigenous-specific drug treatment programs are available for ATSI populations, their orientation is often towards residential treatment programs based on 12-step approaches for alcohol problems (Brady, 1995; Brady, Dawe & Richmond, 1998). There has been little research into the effectiveness of such treatment, or the development of other approaches utilised in mainstream drug treatment services (eg. early and brief interventions, motivational interviewing) (Brady *et al.*, 1998). The appropriateness of new pharmacotherapies for indigenous Australians is currently being evaluated in Victoria by Turning Point. There have been recent initiatives by DASC and NCETA in South Australia to develop home-based detoxification programs in collaboration with Aboriginal communities. Given the high prevalence of drug problems in this population, compared to the general population, this is an area that requires research.

Emerging issues:

- Evaluation of service delivery models to ATSI populations.
- Increasing awareness and acknowledgment of IDU among ATSI communities.
- Evaluation of the efficacy of current IDU strategies and harm minimisation approaches for ATSI.
- Research on the efficacy of drug treatment for ATSI populations.

6.3.5.5 *C&LD populations*

Evidence suggests that migrants tend to increase their alcohol and drug consumption once they have become settled in a new country and persons from C&LD backgrounds are less likely than persons born in Australia to use health and welfare services (Rissel & Rawling, 1991). Despite progress in increasing the accessibility and culturally appropriateness of services, services are still under utilised by C&LD populations. Recent research among Indo-Chinese heroin users in south west Sydney (Maher & Swift, 1997) and Vietnamese speaking injecting drug users in Melbourne (Louie, Krouskos, Gonzalez & Crofts, 1998) reported barriers to accessing treatment services and needle exchanges. The need for culturally sensitive services was highlighted by both studies, as well as culturally appropriate harm reduction messages.

An emerging body of research in the U.S. suggests that natural support systems effectively complement government provided services among these communities. Little research exists on the natural support systems present in Australian C&LD communities, how they are utilised, how they might assist more effective service delivery and how they might be integrated with public health and welfare services.

Current status:

- No studies currently funded.

- DAMEC has a research agenda to document and describe the natural systems that can support illicit drug prevention, intervention and treatment in C&LD communities. Additional research will be conducted on a needs and issues basis.

Emerging issues:

- Need for research into natural support systems in Australian C&LD communities.
- Factors affecting the efficacy of interventions among C&LD populations.
- Cultural appropriateness of interventions, including CBT and group therapy.
- Accessibility of drug treatment services and information for Indo-Chinese.

6.3.5.6 *Prisoners*

NSW remains the only Australian State that provides methadone maintenance treatment to a large number of inmates (approximately 800), being one of few similar programs in the world (Dolan & Wodak, 1996). The NSW Department of Corrective Services have conducted 11 studies of the prison methadone program (Hall, Ward & Mattick, 1993). There is some indication that the program is of benefit to prisoners, but the authors concluded that without a control group it was difficult to be confident. There is some evidence that IDUs in methadone programs were less likely to inject in prison than their untreated peers (Dolan, Wodak & Hall, 1998), and inject less frequently than methadone clients in the community, although partake in higher levels of needle risk-taking behaviour (Darke, Kaye & Finlay-Jones, 1998).

Most inmates could access bleach (Dolan, Hall & Wodak, 1994; Dolan, Shearer, Hall & Wodak, 1996) and condoms (Lowe, 1996) when needed, and no negative consequences arising from their provision were noted. Drug and alcohol counselling is the most common form of treatment offered to inmates, but there have been no controlled studies of this treatment.

With respect to overseas, evidence has emerged from Europe showing that it is feasible to operate syringe exchange programs in prison (Nelles & Harding, 1995), but prison authorities in Australia have been opposed to its trial here.

Gaps in the provision of drug treatment to young offenders have been noted by a number of researchers (Hando, Howard & Zibert, 1997; Copeland, Howard & Fleischmann, in press).

Drug courts, an alternative strategy to imprisonment, will be trialed in NSW soon. In the U.S. the retention rate for drug courts is about 70 percent (Makkai, 1998). Drug courts focus on treatment and aim to rehabilitate or reduce recidivism (see also ADCA, 1996).

Current status:

- A randomised controlled trial of the NSW prison methadone program will be completed in early 1999.
- A trial of three "drug courts" will commence in NSW in 1999.
- There are plans to introduce prison methadone maintenance programs in two other

Australian States.

- The MOTIV project – involving the evaluation of interventions for community-based offenders with high motivation – evaluated by Turning Point.
- Turning Point are evaluating the Victorian CBC Treatment and Testing Policy.
- CREDIT – a trial of court-based intervention (pre-sentencing) is being carried out by Turning Point.
- The Drug Diversion Project is being implemented and evaluated by Turning Point

Emerging issues:

- Controlled studies of the effectiveness of counselling interventions with prisoners are needed.
- Possible uses of alternative pharmacotherapies in prison need to be explored.
- Interventions for girls in juvenile justice settings (Copeland *et al.*, in press).

6.3.5.7 Dually diagnosed

Co-existing psychiatric and other drug use disorders may also be present and could affect treatment outcome if not attended to (Hall & Farrell, 1997). Research on effective interventions in this area is limited. A review of research in the U.S. (Drake, 1998) notes the development over the past 15 years of integrated treatments for patients with severe mental illness and substance disorders, which may be effective in helping dually diagnosed patients attain stable remissions of substance problems. An Australian review of effective treatment approaches for co-morbid psychiatric disorders among stimulant users (Kamieniecki *et al.*, 1998) summarises research on co-morbid schizophrenia, bipolar disorder, affective disorder and attention deficit hyperactivity disorder. However, most of the studies in this area contain few subjects and are uncontrolled, making it difficult to draw conclusions. Hall (1998) reviews interventions for substance abuse (especially cannabis) and schizophrenia, also noting limitations in the design of these studies that preclude the chance of detecting any positive impacts of abstinence on the course of the disorder. Hall (1996) comments that while the majority of substance disorders in the community are time limited and mild and do not require treatment, co-morbid mental and substance disorders have a poorer prognosis, are usually chronic and disabling, are difficult to treat and are usually over-represented in clinical populations. The most common of these, which involve anxiety and affective disorders, are probably the most amenable to treatment (Hall, 1996), although this has not been empirically tested.

Data quality:

- Much of the research on treatment for comorbid disorders has used small samples and uncontrolled designs.

Current status:

- The Victorian government has recently developed an intensive intervention unit for persons with comorbid disorders.

- A study at Newcastle University is conducting a RCT of the efficacy of CBT for clients with dual diagnosis.
- A Central Coast (NSW) project is examining comorbid detection and education among GPs, but research is needed to determine the effects on outcome.

Emerging issues:

- Early interventions for psychosis.
- Early interventions for comorbid anxiety and affective disorders and illicit drug use, especially for youth.
- Need for randomised controlled trials of comorbid interventions.
- Interventions for multiple drug use problems.

6.4 ECONOMIC APPRAISAL OF ILLICIT DRUG PROBLEMS

In the U.S., the economic cost to society of drug abuse and dependency was estimated to be \$98 billion in 1992. Of this figure, \$59 billion was attributed to crime, \$10 billion to health care, \$14 billion to lost lifetime earnings due to premature death and \$14 billion to impaired productivity (NIDA, 1998). Between 1992 and 1995, the cost of drug abuse was estimated to have risen by 12 percent to \$110 billion.

An economic appraisal of the needle and syringe exchange program in Australia found it to be very cost effective. Even under the worst case assumption, the program was still a cost-saving one (Feachem, 1995).

The health care cost of a continuing epidemic of hepatitis C virus infection among Australian IDUs was estimated. If the estimated 10,000 new HCV infections per year continue for the next 60 years, then the total direct health care costs will be around \$4 billion over that period (Brown and Crofts, 1998).

The few economic evaluations of methadone treatment conducted to date suggest that the benefits of treating opioid dependent individuals are greater than the costs incurred in doing so, and that methadone has generally been found to be more cost effective than alternative interventions (Ward & Sutton, 1998).

Most of the work has concentrated on the cost of drug abuse as opposed to providing an economic appraisal of interventions that reduce illicit drug problems. Part of the reason is related to the shortage of health economists in this country. This shortage needs to be addressed if the situation is to change. The cost of illicit drug abuse in Australia was estimated to be \$1.6 billion in 1992, a 26 percent increase since 1988 (Collins & Lapsley, 1996).

Current status:

- The NEPOD project is examining the cost-effectiveness of new pharmacotherapies.
- The PALM treatment intervention for adolescents also examines cost-effectiveness.

Emerging issues:

- Calculation of the global burden of disease (WHO, 1996) where data on potential and actual drug-related harm informs policy on the allocation of resources.
- Cost-effectiveness of interventions which prevent the spread of blood-borne viruses.
- Cost-effectiveness of interventions other than methadone.
- Replication of RAND study (U.S.) on the impact and economic aspects of prevention, treatment and law enforcement drug policies.

7.0 OVERVIEW OF CURRENT ILLICIT DRUG RESEARCH

Details of current projects are listed in Appendix B. The distinction of these projects by the four key research domains is somewhat arbitrary as some research falls into more than one category. For example, most projects on the epidemiology of illicit drug use also examine associated harms. These two categories have therefore been combined. In other cases where there is overlap, or where there was insufficient detail about the project, a category has been estimated. Limited details were provided about the specific nature of research projects, making classification into further levels difficult. This data is also limited by the non-response of some organisations, and the provision of incomplete data by others. Variable estimates of funds were provided by funding bodies and host institutions in a minority of cases. When this has occurred, the highest figure has been reported. Details of pending or planned projects were not comprehensively collected, nor were details of non-funded projects (eg. pilot studies, postgraduate research). Note also that the focus on illicit drugs in some of these projects is secondary.

Information on 128 research projects was obtained. The majority of projects examined interventions for illicit drug problems (n=69) or patterns of illicit drug use and harms (n=49). Few studies examined antecedents and risk factors for illicit drug use (n=10), although as mentioned above, some of the studies in other categories probably collected this type of data.

In particular, the projects on epidemiology/harms examined: cannabis (n=6); opioid overdose (n=3); other opioid-related harms (n=4); stimulants (n=2); C&LD communities (n=5); injecting drug use/blood-borne viruses (n=7); gay communities (n=3); steroids (n=1); and monitoring illicit drug use and harms (n=11). Other projects could not be classified.

Projects on risk factors are mainly laboratory studies on the opioids (n=5), although three studies on risk factors for adolescent drug use were being conducted, and one study on risk factors for unsafe sex.

Finally, most projects on drug interventions examined methadone maintenance (n=6) and other pharmacotherapies for opioid dependence (maintenance and withdrawal; n=22). Some of these were in special populations, such as, ATSI, persons from C&LD backgrounds, and prisoners. Several studies examined law enforcement responses to illicit drugs (n=10). Other studies examined: benzodiazepine and other forms of withdrawal (n=4), amphetamine treatment and prevention (n=4), self-help interventions (n=2), prevention programs among C&LD communities (n=3), treatment outcomes (n=2), cannabis treatment (n=1), prevention

of overdose (n=1), other treatment for ATSI communities (n=2), treatment for adolescents (n=2) and treatment for comorbid disorders (n=1).

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9.0 APPENDICES

APPENDIX A: STAKEHOLDER DETAILS

The following people participated in the survey:

Dr Gabriele Bammer (NCEPH)
Maggie Brady (Australian Institute for Aboriginal and TSI Studies)
Dr Jan Copeland (NDARC)
Dr Shane Darke (NDARC)
Dr Paul Dietze (Turning Point)
Prof. Wayne Hall (NDARC)
Dr John Howard (Macquarie University)
Simon Lenton (NCRPDA)
Dr Wendy Loxley (NCRPDA)
Dr Michael Lynskey (NDARC)
Dr Lisa Maher (NDARC)
Margaret MacDonald (NCHECR)
Dr Nick Martin (University of QLD)
A/Prof. Richard Mattick (NDARC)
Dr Iain McGregor (University of Sydney)
Rebecca McKetin (NDARC)
Richard Peters (NDARC)
Dr Vaughan Rees (NDARC)
Dr Alison Ritter (Turning Point)
Joanne Ross (NDARC)
Dr Greg Rumbold (Turning Point)
James Shearer (NDARC)
Jodie Shoobridge (NCETA)
Erica Southgate (National HIV Social Research Centre, Macquarie University)
Catherine Spooner (NDARC)
Wendy Swift (NDARC)
Shane Taylor (DAMEC)
Dr Maree Teesson (NDARC)
Dr John Toumbourou (Centre for Adolescent Health, Melbourne University)

The following people provided comments on a draft of the report:

Dr Gabriele Bammer (NCEPH)
Andrea Beel (NCETA)
Rod Bennison (NUAA)
Maggie Brady (Australian Institute for Aboriginal and TSI Studies)
Dr Jan Copeland (NDARC)
Dr Nick Crofts (MBCMR)
Dr Paul Dietze (Turning Point)
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Richard Peters (NDARC)
Dr Alison Ritter (Turning Point)
Dr Greg Rumbold (Turning Point)
James Shearer (NDARC)
Jodie Shoobridge (NCETA)
Erica Southgate (National HIV Social Research Centre, Macquarie University)
Catherine Spooner (NDARC)
Wendy Swift (NDARC)
Shane Taylor (DAMEC)
Libby Topp (NDARC)
Dr John Toumbourou (Centre for Adolescent Health, Melbourne University)
Mal Wares (Commonwealth Department of Health and Aged Care)
Paul Williams (AIHW)
Dr Alex Wodak (St Vincents Hospital)
Dr Deborah Zador (Central Sydney Area Health Service)

APPENDIX B: FUNDING DETAILS

Funding details of current projects on illicit drug use were provided by the following organisations:

Commonwealth Department of Health and Aged Care
National Health & Medical Research Council
Australian Research Council
National Centre in HIV Epidemiology and Clinical Research
National Centre in HIV Social Research
National Drug and Alcohol Research Centre
National Centre for Research into the Prevention of Drug Abuse
Australian Institute of Criminology
National Centre for Education and Training in the Addictions
National Police Research Unit
Turning Point Alcohol and Drug Inc.
Centre for Education and Information on Drugs and Alcohol
Mcfarlane Burnet Centre for Medical Research
Drug and Alcohol Services Council
University of Adelaide (Department of Clinical and Experimental Pharmacology)
University of Sydney (Department of Psychology)
University of Newcastle

Additional organisations (such as NCEPH) were not able to provide funding details in the time available for the project.

TABLE 1: FUNDING DETAILS FOR CURRENT PROJECTS ON PATTERNS OF ILLICIT DRUG USE AND ASSOCIATED HARMS

| Project Title | Host institution* | Funding source* | Total funds | Years# | Status |
|--|--------------------------|------------------------|--------------------|----------------------|------------------------------|
| Effects of alcohol and marijuana in young, novice and experienced drivers: a simulator study | Monash Uni | NH&MRC | \$222,648 | 1998-2000 | In progress |
| Cognitive changes associated with cannabis use - acute effects, withdrawal and treatment | NDARC | RIDAP | \$149,582 | 1994-1996 2 years | In progress |
| The neural, behavioural and cognitive effects of cannabinoids | Uni of Sydney | ARC | \$225,000 | 1995-2000 | In progress |
| Cannabis and driving | Turning Point | NH&MRC | \$208,000 | 1998-2000 | In progress |
| CSAT study on marijuana dependence | NDARC | SAMHSA | \$85,266 | 1998-2001 3 years | In progress |
| Comprehensive scientific database for illicit drugs | SFSL (VIC) | NDCPF | \$76,575 | 1993 | Due for completion late 1999 |
| Retrospective study of the circumstances of opioid overdose deaths | NCRPDA | WA DASO | \$4,896 | 1998 4 mths | In progress |
| Impact of maintenance pharmacotherapies on driving | Turning Point | VIC Govt | Note 2 | 1998-2001 | Pending |
| | | | | | |
| | | | | | |

| Project Title | Host institution* | Funding source* | Total funds | Years# | Status |
|---|---|--------------------------------------|--------------------|---------------------|---------------|
| Fatal heroin overdose project | Turning Point | VIC LEDF | not specified | 1998-2000 | In progress |
| Investigation of heroin purity, composition and smoking efficiency | NDARC | NSW DAD | \$9,359 | 1997-1998 | In progress |
| National Illicit Drug Reporting System (IDRS) | NDARC, Turning Point, DASC (& other States) | CDHFS | \$864,027 | 1998-2001 (3 years) | In progress |
| Illicit drug statistical analysis; clients of treatment services data; study to estimate the number of heroin users | NDARC | CDHFS | \$450,000 | 1998-2001 (3 years) | In progress |
| Heroin smoking/injecting and HIV | NDARC | National Institutes of Health (U.S.) | \$104,960 | 1996-1999 | In progress |
| Electrophysiological investigation of cocaine sensitization | Flinders Uni of SA | NH&MRC | \$163,234 | 1998-2000 | In progress |
| Psychostimulant use and reckless or violent behaviour | NCRPDA | NDCPF | \$91,372 | 1995-1998 | In progress |
| Contextualising illegal drug use: instituting procedures for monitoring illegal drug-use | Uni of Melbourne | NH&MRC | \$209,556 | 1994-1998 | In progress |
| An ethnographic study of drug use among Vietnamese-speaking people in Melbourne | MBCMR | NH&MRC | \$73,067 | 1997 | In progress |
| Recent initiates to heroin use in southwest | NDARC | NH&MRC | \$212,418 | 1997-2001 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years# | Status |
|---|----------------------------------|------------------------|--------------------|----------------|---------------|
| Sydney | | | | | |
| The relationship between injecting drug use, spatiality, HIV/AIDS and drug-related harm | Uni of Melbourne | NH&MRC | \$212,970 | 1998-1999 | In progress |
| Parenting in the sociocultural context of illicit drug or harmful alcohol use | ANU | NH&MRC | \$207,594 | 1998-2001 | In progress |
| Cultures and practices of drug-taking among Sydney gay youth (scholarship) | NCHSR, MacqUni | NH&MRC | \$66,009 | 1998-2000 | In progress |
| NDS scholarship on cannabis dependence | NDARC | CDHFS | \$74,486 | 1995-1998 | In progress |
| NDS scholarship on novice injecting drug users & HCV: assessing the risks and designing harm reduction messages | NCRPDA | CDHFS | \$69,612 | 1996-98 | In progress |
| NDS scholarship on becoming an anabolic steroid user: an ethnographic study of steroid users | Curtin Uni of Technology (WA) | CDHFS | \$69,612 | 1995-? | In progress |
| Drug use and street culture in Indochinese youth | Faculty of Health, UWSM | RIDAP | \$22,831 | 1995-? | In progress |
| Studies of quantification of the health effects of drugs | Dept of Public Health, Uni of WA | RIDAP | \$111,947 | 1995 1 year | In progress |
| Evaluation of incidence recurrence and survival from alcohol and illicit drug abuse | Dept of Public Health, Uni of WA | RIDAP | \$52,891 | 1996 1 year | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years# | Status |
|---|--------------------------|-----------------------------|----------------------|---------------|---------------|
| Reintegrative shaming, drugs and crime | ANU | NDCPF | \$748,500 | 1995-1998 | In progress |
| Narcotic treatment and road safety | Uni of Sydney | NDCPF | \$29,343 | 1995-1998 | In progress |
| Development of a national drug statistics framework | ABCI | NCBADLE | \$95,698 | 1997-1998 | In progress |
| Drug use and gay men project | NCHSR, MacqUni | Core funding & ARC | \$168,802 \$6,000 | 1997-1998 | In progress |
| Gay men and drug use | NCHSR, MacqUni | NSW Health Dept, AIDB | \$46,000 | 1997-1998 | In progress |
| Clinical assessment of a retrospective cohort of patients with acute hepatitis | MBCMR | VHPF | \$137,052 | 1997-1999 | In progress |
| Study into HIV, HBV & HCV in Vietnamese injecting drug users and the production of educational materials and an information kit | MBCMR | VIC govt (Turning the Tide) | \$86,840 | 1997-1998 | In progress |
| Drugs in a multicultural community - an assessment of involvement | MBCMR | VIC DHS | \$180,250 | 1998-1999 | In progress |
| Culture, crime and community | NDARC | NSW AGD | \$15,000 | 1997-1998 | In progress |
| National minimum data set for alcohol and other drug treatment agencies | NDARC | CDHFS | \$73,760 | 1997-1998 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years# | Status |
|---|--------------------------|------------------------|--------------------|----------------------|---------------|
| Illicit drugs and property crime | AIC | NIDS | \$200,000 | 1998-1999 | In progress |
| Drug use monitoring in Australia (DUMA) | AIC | NIDS | \$1,260,000 | 1997-2000 3 years | In progress |
| Non-fatal heroin OD project | Turning Point | VIC govt | Note 1 | 1997-98 | In progress |
| Testing for blood borne viral infections in injecting drug users | NCRPDA | NH&MRC | \$50,861 | 1997 | In progress |
| Development of a lexicon of demand reduction terms | NCRPDA | CDHFS | \$20,800 | 1997-1998 | In progress |
| Pilot study - screening for psychoactive substance use in primary health care settings | DASC | DASC | \$4,000 | 1998 | In progress |
| Needle and syringe exchange survey (National) | NCHECR | CDHFS | \$44,417 | 1998 | In progress |
| NSW health needle exchange (Darlinghurst Road) | NCHECR | NSW Health Dept, AIDB | \$20,000 | 1998 | In progress |
| National surveillance for Hepatitis C | NCHECR | CDHFS | \$80,000 | 1998 | In progress |
| A comparison of non-fatal heroin overdose (at the time of the event) in two areas of Sydney | CSAHS SWSAHS | NSW DAD | \$45,000 | 1998 | In progress |
| National Coronial Information System – Illicit Drugs module | Monash Uni, NCCI | CDHAC | \$160,000 | 1998-2000 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years# | Status |
|-------------------------------|--------------------------|------------------------|--------------------|---------------|---------------|
| NDS National Household Survey | Roy Morgan / AIHW | CDHAC | \$500,000 | 1998-1999 | In progress |

TABLE 2: FUNDING DETAILS FOR CURRENT PROJECTS ON ANTECEDANTS AND RISK FACTORS

| Project Title | Host institution* | Funding source* | Total funds | Years# | Status |
|---|--------------------------|------------------------|--------------------|---------------|---------------|
| Mechanisms of opioid dependence in the ventral tegmenta 1 area | ANU | NH&MRC | \$230,897 | 1996-2000 | In progress |
| The role of tachykinins in sensitization to stress and opioid administration and withdrawal | Uni of Newcastle | NH&MRC | \$266,084 | 1997-1999 | In progress |
| Cellular mechanisms of opioid physical dependence | Uni of Sydney | NH&MRC | \$707,688 | 1998-2000 | In progress |
| Functional interactions between central opioid and tachykinin systems | Uni of Newcastle | NH&MRC | \$202,924 | 1994-1998 | In progress |
| Neural mechanisms of opiate reward in the nucleus accumbens: an electrophysiological study | Uni of QLD | NH&MRC | \$208,219 | 1997-1999 | In progress |
| The neural basis of drug addiction | Uni of Sydney | NH&MRC | \$157,088 | 1996-1998 | In progress |
| Adolescent health risk behaviours and psychopathology: continuities into adulthood | Uni of Melbourne, CAH | NH&MRC | \$72,412 | 1998-2002 | In progress |
| Transition to drug and alcohol dependency in young people: A representative | RCHRF | NH&MRC | \$75,390 | 1998-2000 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years# | Status |
|---|--------------------------|------------------------|--------------------|---------------|---------------|
| longitudinal study | | | | | |
| Risk factors for unsafe sex | NCHECR | NSW Health Dept, AIDB | \$18,950 | 1998 | In progress |
| Longitudinal pathways to adolescent adjustment and maladjustment: risk and resiliency | Uni of Melbourne, CAH | NH&MRC | \$76,892 | 1998-2000 | In progress |

TABLE 3: FUNDING DETAILS FOR CURRENT PROJECTS ON INTERVENTIONS

| Project Title | Host institution* | Funding source* | Total funds | Years # | Status |
|--|--------------------------|------------------------|----------------------------|----------------------|---------------|
| Brief interventions for cannabis dependence | NDARC | RIDAP | \$180,676 | 1995-1997 2 years | In progress |
| Evaluation of a remote sensing system | WA Police Dept | NDCPF | \$100,000 | 1994-1998 | In progress |
| Metabolism and disposition of methadone in a methadone maintenance population (scholarship) | Uni of Adelaide | NH&MRC | \$28,751 | 1997-1998 | In progress |
| An evaluation of the NSW prison methadone program | NDARC | RIDAP | \$209,018 | 1995-1997 2 years | In progress |
| Evaluation of a trial to reduce overdose morbidity and mortality among heroin users in SA | DASC | RIDAP | \$59,999 | 1995 13 months | In progress |
| Development of procedures for assessing the achievement of learning objectives for methadone prescribers | NCETA | CDHFS | \$13,300 | 1997-1998 | In progress |
| Evaluation of the efficacy and acceptability of tincture of opium in the treatment of opioid dependency | DASC | CDHFS | \$115,050 | 1997-1998 | In progress |
| Comparative study of buprenorphine and methadone in the treatment of opioid dependence - a multi-centre study. | DASC NDARC DCEP | CDHFS R&C NDARC | \$39,628 plus \$400,000 | 1997-1998 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years # | Status |
|---|--------------------------|------------------------|--------------------|----------------------|------------------|
| A pilot study assessing the utility of methadone maintenance for Indigenous Australian IDUs: Impediments to treatment entry and treatment effectiveness | NCETA | SA DHS | \$11,000 | 1998 | In progress |
| Exiting the heroin market | NSW BCSR | NCBADLE | \$21,898 | 1998-1999 14 mths | In progress |
| LAAM implementation trial (NPP) | Turning Point | VIC Govt | Note 2 | 1998-2001 | Pending |
| Buprenorphine implementation trial (NPP) | Turning Point | VIC Govt | Note 2 | 1998-2001 | Pending |
| Methadone withdrawal using buprenorphine (NPP) | Turning Point | VIC Govt | Note 2 | 1998-2001 | Pending |
| Heroin withdrawal using buprenorphine (NPP) | Turning Point | VIC Govt | Note 2 | 1998-2001 | In progress |
| Naltrexone treatment outcome study (NPP) | Turning Point | VIC Govt | Note 2 | 1998-2001 | Pending |
| Naltrexone side effects study (NPP) | Turning Point | VIC Govt | Note 2 | 1998-1999 | Pending |
| Slow-release oral morphine pilot study | Turning Point | VIC Govt | Note 2 | 1998-2001 | Commence in 1999 |
| Vietnamese heroin users and buprenorphine | Turning Point | VIC Govt | Note 2 | 1998-2001 | Commence in 1999 |
| Protocol for individualised treatment of benzodiazepine withdrawal | DCEP | RIDAP | \$37,522 | 1997-98 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years # | Status |
|---|--------------------------|------------------------|--------------------|------------------------|---------------|
| Effectiveness and acceptability of LAAM as a maintenance pharmacotherapy | DCEP | DASC | \$90,000 | 1997-1999 | In progress |
| Pharmacokinetic determinants of opioid withdrawal | DCEP | ARC | \$10,000 | 1998 | In progress |
| Pharmacokinetic and pharmacodynamics of LAAM | DCEP | VIC Dept of Health | \$112,331 | 1998-1999 | In progress |
| Slow release morphine as substitution therapy in opioid dependence | DCEP | VIC Dept of Health | \$77,055 | 1998-1999 | In progress |
| Randomised trial of anaesthesia based rapid opioid detoxification | DCEP | SA DHS | \$464,000 | 1998-2000 | In progress |
| An evaluation of the NSW prison methadone program | NDARC | CDHFS | \$88,559 | 1997-1998 | In progress |
| Methadone review for Prevention Working Group of the Advisory Council on the Misuse of Drugs (U.K.) | NDARC | U.K. Dept of Health | \$14,306 | 1998 | In progress |
| Withdrawal from opioid replacement therapy | NDARC | NSWDAD | \$159,427 | 1997-1999 | In progress |
| National evaluation of pharmacotherapies for opioid dependence | NDARC | CDHFS | \$1,299,999 | 1998-2001 (3 years) | In progress |
| NSW treatment monitoring and outcomes | NDARC | NSWDAD | \$270,000 | 1998-2000 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years # | Status |
|--|--------------------------|------------------------|--------------------|----------------------|---------------|
| project; treatment of illicit drug users | | | | (2 years) | |
| Urinary amphetamine isomer monitoring of controlled prescribing of amphetamines | NDARC | RIDAP | \$68,792 | 1997-1999 | In progress |
| Responding to hazardous and harmful use of amphetamines (Phase 2) | NCETA | CDHFS | \$112,962 | 1996-1998 | In progress |
| Investigation of the issues in the regulation of cannabis possession, use and supply | NCRPDA | VIC parliament | \$50,545 | 1998-1999 | In progress |
| Randomised controlled evaluation of two counselling interventions among regular users of amphetamines | Uni of Newcastle | Uni of Newcastle | \$10,000 | 1998 | In progress |
| Indigenous notions of medicine and health, particularly as they relate to addictions, prevention and treatment (scholarship) | Uni of QLD | NH&MRC | \$17,895 | 1998 | In progress |
| Identification of the essential elements of a contemporary, culturally appropriate, indigenous rehabilitation | Curtin Uni of Tech (WA) | NH&MRC | \$52,164 | 1998-2000 | In progress |
| Evaluation of the role of self help groups in drug treatment | Uni of Melbourne | RIDAP | \$215,588 | 1992-1995 3 years | In progress |
| Randomised controlled trial of an adolescent treatment program | NDARC | RIDAP | \$209,018 | 1995-1998 3 years | In progress |
| Dual diagnosis: impact of intervention | Uni of Newcastle | RIDAP | \$198,000 | 1997-1999 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years # | Status |
|---|--------------------------|------------------------|--------------------|----------------------|---------------|
| | | | | 3 years | |
| Protocol for individualised treatment of benzodiazepine withdrawal | DCEP | RIDAP | \$37,522 | 1996-1998 2 years | In progress |
| Preventing adolescent drug related harm through parental skills training | Uni of Melbourne, DP | RIDAP | \$46,096 | 1996 1 year | In progress |
| Naloxone feasibility study | NCRPDA | WA Health Dept. | \$80,000 | 1998 18 mths | In progress |
| Forging alliances with parent organisations | NCRPDA | Div HS, WA RPI Funds | \$11,000 | 1998 4 mths | In progress |
| Drug harm reduction education for police in Australia | NCETA | NCBADLE | \$63,351 | 1998-1999 | In progress |
| Development and dissemination of models of best practice in diversion programs (phase 3) | ADCA | NDCPF | \$56,500 | 1996-1998 | In progress |
| A community based drug law enforcement model for intersectorial harm reduction - trials at four sites | NSW Police | NCBADLE | \$66,600 | 1998-1999 16 mths | In progress |
| A community based drug law enforcement model for intersectorial harm reduction - trials at four sites | WA Police (Geraldton) | NCBADLE | \$61,450 | 1998-1999 16 mths | In progress |
| A community based drug law enforcement | WA Police | NCBADLE | \$67,890 | 1998-1999 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years # | Status |
|---|---------------------------------|---|---------------------------------------|----------------------|---------------|
| model for intersectorial harm reduction - trials at four sites | (Mirrabooka) | | | 16 mths | |
| A community based drug law enforcement model for intersectorial harm reduction - trials at four sites | VIC Police | NCBADLE | \$64,275 | 1998-1999 16 mths | In progress |
| Evaluation of the community based drug law enforcement model for intersectorial harm reduction | Dept Criminology, Melbourne Uni | NCBADLE | \$115,305 | 1998-1999 18 mths | In progress |
| Evaluation of the community based drug law enforcement model for intersectorial harm reduction | NCRPDA | NCBADLE | \$131,389 | 1998-1999 18 mths | In progress |
| Best practice in the role of police in diversion | Dept Criminology, Melbourne Uni | NCBADLE | \$167,395 | 1998-1999 | In progress |
| Social impact study: WAHS needle and syringe program | NCHSR, MacqUni | WAHS | \$32,000 | 1998-1999 | In progress |
| The Asian harm reduction network - targeting HIV and injecting drug use in Asia | MBCMR | The Drug Policy Foundation (US) AUSAID UNAIDS | US\$92,000 \$14,976 US \$27,500 | 1996 1997 1998 | In progress |
| The Asian harm reduction network manual on HIV and HCV prevention in Asia | MBCMR | CDHFS | \$48,500 | 1997-1998 | In progress |
| Developing a response to drug use by | MBCMR | Melbourne City | \$14,500 | 1998 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years # | Status |
|--|--------------------------|------------------------|--------------------|----------------|---------------|
| young South East Asian people in the CBD of Melbourne | | Council | | | |
| Evaluation of community drug withdrawal services | Turning Point | VIC Govt | Note 1 | 1997-1998 | In progress |
| Drug self help and peer support services | DART, Melb Uni | VIC DHS | Not specified | 1997-1998 | In progress |
| Co-ordination of the development of an international resource series on demand reduction | NDARC | CDHFS | \$65,458 | 1997-1999 | In progress |
| The WA component of the analysis of the social impacts of the Cannabis Expiation Notice System of SA | NCRPDA | CDHFS | \$60,567 | 1997-98 | In progress |
| Cochrane review - best practice in managing intoxication and withdrawal | DASC | DASC CDHAC | \$16,872 | 1996-1997 | In progress |
| Evidence-based clinical guidelines on initiation of methadone maintenance treatment | DASC | CDHFS | \$70,700 | 1998-1999 | In progress |
| Review of the English and Holman aetiological fractions | AIHW | CDHFS | Not available | 1998 | In progress |
| Development of minimum dataset for drug treatment services | AIHW | CDHFS | Not available | 1998-1999 | In progress |

| Project Title | Host institution* | Funding source* | Total funds | Years # | Status |
|--|--------------------------|------------------------|--------------------|----------------|---------------|
| Sedation-assisted opiate withdrawal versus a wait list control | Sydney Hospital | NSW Govt | Not available | 1998-1999 | In progress |
| Anaesthesia vs. sedation-assisted opiate withdrawal vs. methadone maintenance | Royal Brisbane Hospital | QLD Govt | Not available | 1998-2000 | In progress |
| Anaesthesia vs. sedation-assisted withdrawal vs. conventional withdrawal (pilot study) | Westmead Hospital | NSW DAD | \$731,000 | 1998-1999 | In progress |
| A feasibility study into the provision of naloxone to heroin users for peer administration | NCRPDA | Health Dept of WA | \$27,650 | 1998-1999 | In progress |
| Better practice in Hepatitis C prevention: A review of current prevention education activities for people who inject drugs | LaTrobe University | CDHFS | \$99,900 | 1998-1999 | In progress |

* see below for glossary of terms

years study is in progress (not actual years funded)

Note 1: Turning Point is provided with an annual block grant to conduct a number of research projects. This grant amounts to approximately \$1.4m per annum

Note 2: The projects covered by NPP are funded to a total of \$3m over 3 years

GLOSSARY

| | |
|-------------|---|
| ABCI | Australian Bureau of Criminal Intelligence |
| ADCA | Alcohol & Other Drugs Council of Australia |
| AIC | Australian Institute of Criminology |
| AIDB | AIDS and Infectious Diseases Branch, NSW Department of Health |
| AIHW | Australian Institute of Health and Welfare |
| ANU | Australian National University |
| ARC | Australian Research Council |
| AUSAID | Australian Agency for International Development |
| CAH | Centre for Adolescent Health |
| CDHAC | Commonwealth Department of Health and Aged Care |
| CDHFS | Commonwealth Department of Health and Family Services |
| CSAHS | Central Sydney Area Health Service |
| DASC | Drug and Alcohol Services Council |
| DART | Drug and Alcohol Research Team, Melbourne University |
| DCEP | Department of Clinical & Experimental Pharmacology, University of Adelaide |
| Div HS | Division of Health Sciences |
| DP | Department of Paediatrics |
| MBCMR | Macfarlane Burnet Centre for Medical Research |
| MacqUni | Macquarie University |
| NCETA | National Centre for Education and Training on Addiction |
| NCRPDA | National Centre for Research into the Prevention of Drug Abuse |
| NCBADLE | National Community Based Approach to Drug Law Enforcement |
| NCCI | National Centre for Coronial Information |
| NCHECR | National Centre in HIV Epidemiology and Clinical Research |
| NCHSR | National Centre in HIV Social Research |
| NDARC | National Drug and Alcohol Research Centre |
| NDCPF | National Drug Crime Prevention Fund |
| NH&MRC | National Health and Medical Research Council |
| NIDS | National Illicit Drugs Strategy |
| NSWAGD | NSW Attorney Generals Department |
| NSW BCSR | NSW Bureau of Crime, Statistics and Research |
| NSW DAD | NSW Drug and Alcohol Directorate, NSW Department of Health |
| RCHRF | Royal Children's Hospital Research Foundation |
| R&C | Reckitt & Coleman |
| RPI | Research Performance Index |
| RIDAP/RIDAG | Research into Drug Abuse Grants |
| SAMHSA | Substance Abuse and Mental Health Services Administration (U.S.) |
| SA DHS | SA Department of Human Services |
| SFSL | State Forensic Science Laboratory |
| SWSAHS | Southwest Sydney Area Health Service |
| UNAIDS | Joint United Nations Programme on HIV/AIDS |
| UWSM | University of Western Sydney, Macarthur |
| VHPF | Victorian Health Promotion Foundation (VIC Health) |
| VIC LEDF | Victorian Law Enforcement Drug Fund |
| VIC DHS | Victorian Department of Human Services |

WA DASO
WAHS

WA Drug Abuse Strategy Office
Wentworth Area Health Service, NSW Department of Health